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HIGHWAYS AND PUBLIC WORKS

*View of New Ridge Route Section
(State Route No. 4) in Grapevine Canyon.*

Official Journal of the Department of Public Works
SEPTEMBER - 1935



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\$21,545,370 for Highway

Construction of Major Projects

In Revised Budget

For 87th and 88th Fiscal Years

By JULIEN D. ROUSSEL, Secretary California Highway Commission

THE revised State highway budget for the 87th and 88th fiscal years, July 1, 1935, to June 30, 1937, as adopted by the California Highway Commission and presented to Governor Frank F. Merriam for approval by Chairman Harry A. Hopkins provides \$21,545,370 for major project construction throughout the State during the biennium in comparison with \$26,498,980 set up in the original budget adopted by the Commission December 27, 1934.

The revised budget was approved and made public by Governor Merriam September 12th and in an accompanying statement he said that despite the necessity of reducing proposed expenditures by some \$6,000,000 in consequence of the act passed by the last Legislature increasing the allocation of gasoline tax funds to municipalities by approximately that amount, it made him very happy to be able to announce that in all important essentials the program for improvement of State highways remains practically as originally compiled.

The Commission accomplished this happy result by several means. First, by underwriting the entire Federal relief program allocated to the State which enabled the Commission to apply on State highway projects about \$3,860,000 of the \$7,747,928 Federal Works

Progress road funds apportioned to California, thereby releasing State funds for retention of programmed projects;

Second, by applying on State highway construction projects within cities approximately \$1,690,000 of the $\frac{1}{4}$ cent allocation made by the Legislature, and third, by reduction of certain projects and elimination of

several less important projects, improvement of which will be deferred until the next biennium.

The allotment to the State under Federal Emergency Relief Apportionment Act of 1935 was predicated primarily upon the use of 90 per cent of labor from relief rolls and on the basis that the amount paid from Federal funds would be limited to \$1,400 per man-year on every approved project. The cost of highway projects in California average \$3,000 per man-year including engineering, materials, transportation, supplies,

equipment and necessary incidentals thereof.

By arrangement with the Federal government the State has agreed to underwrite the man-hours of labor which would be produced by the Federal allotment, selecting a program of projects subject to approval of the U. S. Bureau of Public Roads, the Works Progress Administration and the National Emergency Council.



JULIEN D. ROUSSEL

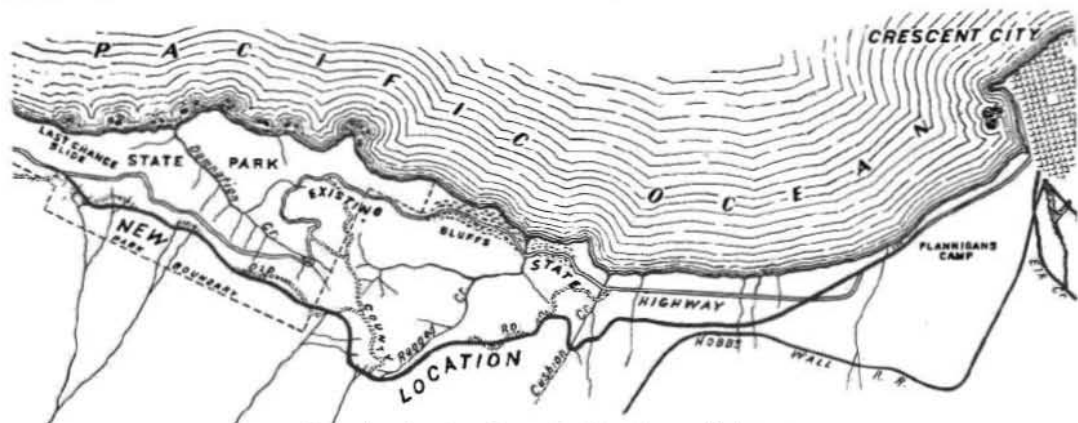
Two States Join in Dedication of Relocated Redwood Highway Sector

WITH picturesque pageantry in which present day leaders of California and Oregon joined with descendants of early pioneers, costumed Indians and Oregon "cavemen," the recently completed sector of the Redwood Highway (State Route No. 1) in Del Norte County, south of Crescent City, was formally dedicated on Sunday, August 18th.

The reconstruction of this nine mile sector between Last Chance Slide and Flanagan's saves eight-tenths of a mile in distance and

boughs, dahlias and other native flowers of Del Norte County, tied together with a buckskin thong.

When Chief Robert Spott, Klamath Indian, severed the buckskin thong with a century-old Indian flint-knife, the gates were opened by the chief and his fellow tribesmen, together with Miss Redwood Empire (Jean Griffin), Miss Del Norte County, an Indian princess (Evelyn McDonald), Miss Crescent City (Lora Childs), Miss Smith River (Jean Sanford) and Miss Klamath (Margreta Crone).



Map showing locations of old and new highway

eliminates 205 sharp and dangerous curves totaling 9557 degrees of curvature or about twenty-six and one-half complete circles.

The savings to motorists in operating costs, conservatively estimated at thirty cents per vehicle trip and based on present traffic count figures, will amortize the entire construction cost of \$725,000 in slightly less than ten years.

THREE CARAVANS ARRIVE

Under clear blue skies, along the shores of the Pacific just south of Crescent City, three caravans arrived at the dedication "barrier"—one from Klamath, which drove through groves of Giant Redwoods over the new sector; another from Grants Pass, Oregon, and another from Smith River, on the Del Norte Coast Highway.

The barrier was in the form of two massive gates—colorfully decorated with redwood

PROGRAM ON BEACH

The Grants Pass Municipal Band, which headed the Grants Pass Caravan, then led the combined caravans into Crescent City under direction of Grand Marshall H. G. Ridgway, Chairman Events Committee, Redwood Empire Association. Marshal for the Grants Pass Caravan was W. M. Moses, representing Grants Pass Chamber of Commerce and the Smith River Caravan was led by President William Buckner of Smith River Chamber of Commerce.

At Crescent City the official party was tendered a complimentary luncheon by the Del Norte County and Crescent City Chambers of Commerce.

The formal dedication program followed—on the beach at Crescent City, adjacent to the Ocean Drive. The speakers' stand was beautifully decorated with redwood boughs and flowers by the various womens clubs of

(Continued on page 18)



JOINING HANDS AT THE BARRIER, Deputy Director Edward J. Neron of the California Department of Public Works, representing Governor Frank F. Merriam, and Senator John D. Goss of Oregon, representing Governor C. H. Martin of that State, exchanged congratulations on the dedication of the new section of the Redwood Highway south of Crescent City. Deputy Director Neron is at the microphone. Bottom pictures show portions of the new highway through the Redwood forest and along the coast.

M Street Bridge Spans 95 per cent Complete; Opening Set for November

By G. W. THOMPSON, Resident Engineer

THE M Street Bridge across the Sacramento at the foot of M Street in Sacramento is rapidly nearing completion and will soon provide an adequate and impressive highway entrance into the Capital City from the west.

The new bridge will accommodate two lanes of highway traffic in each direction with a single railroad track in the center. Concrete curbs on each side of the railroad protect the highway traffic. In addition, there is a four foot clear width sidewalk on each side of the bridge to carry pedestrian traffic. A heavy guard rail made of steel protects the pedestrians from highway traffic and an ornamental steel handrail is placed on the outside.

The two center piers supporting the approach span and lift span are set on large concrete blocks part of which were poured under water. Their total height is some 84 feet of which 40 feet is below the river bottom. They rest upon a foundation of gravel and boulders. Since these two piers flank the main river channel, they will be protected from barges and steamers by heavy creosoted pile fenders.

PIERS AND ABUTMENTS PLACED

Foundation for the rest of the piers and abutments consists of either Douglas Fir piling or reinforced concrete piling. The general contractor has recently completed the placing of the east and west abutments and west approach piers of which there are three. These piers and abutments, together with the main river piers, supporting the steel structure are now complete.

The superstructure consists of four short steel stringer spans, a 225 foot and 167 foot steel truss span, a 202 foot steel truss lift span which provides for a 97 foot vertical clearance above extreme high water, and a short combination reinforced concrete girder and steel stringer span connecting the front and rear wall of one of the end abutments, making a total length of about 738 feet.

The two approach spans, the lift span, and the lift span towers which rise to a height of 160 feet above the lower chord, are now 95 per cent erected and riveted. The towers will be the fourth highest structures in the city and will be covered with a sheet metal

giving them a modernistic and imposing appearance. The entire steel structure is to be given a final coat of aluminum paint.

LIGHT WEIGHT CONCRETE

The deck and sidewalk of the steel spans and west approach stringer spans will be of lightweight concrete weighing under 100 pounds per cubic foot as compared to 150 pounds per cubic foot for ordinary concrete. This amounts to a saving in weight of 33 per cent and allows for a great saving in steel in the design of the steel trusses.

Some of the aggregate going into the concrete is so light that it will actually float on water, but the strength of the concrete made from it is little less than is obtained from the use of standard aggregates. A thin layer of topping is also placed for wear and finishing. Placing of this concrete is now in full swing with two spans complete.

Inside each tower and hanging by cables passing over large sheave wheels and connected to the lift span is a large steel box to be filled with concrete to balance the weight of the lift span so that raising and lowering of the span might be accomplished with much more ease and less power.

HEAVY BALANCE CHAIN

A large balance chain resembling a bicycle chain but weighing 515 pounds per lineal foot hangs from the counterweight box and is connected to the tower. This chain is so designed that the weight of the counterweight cable in passing from one side of the tower to the other as the lift span is raised or lowered will always be balanced by this chain.

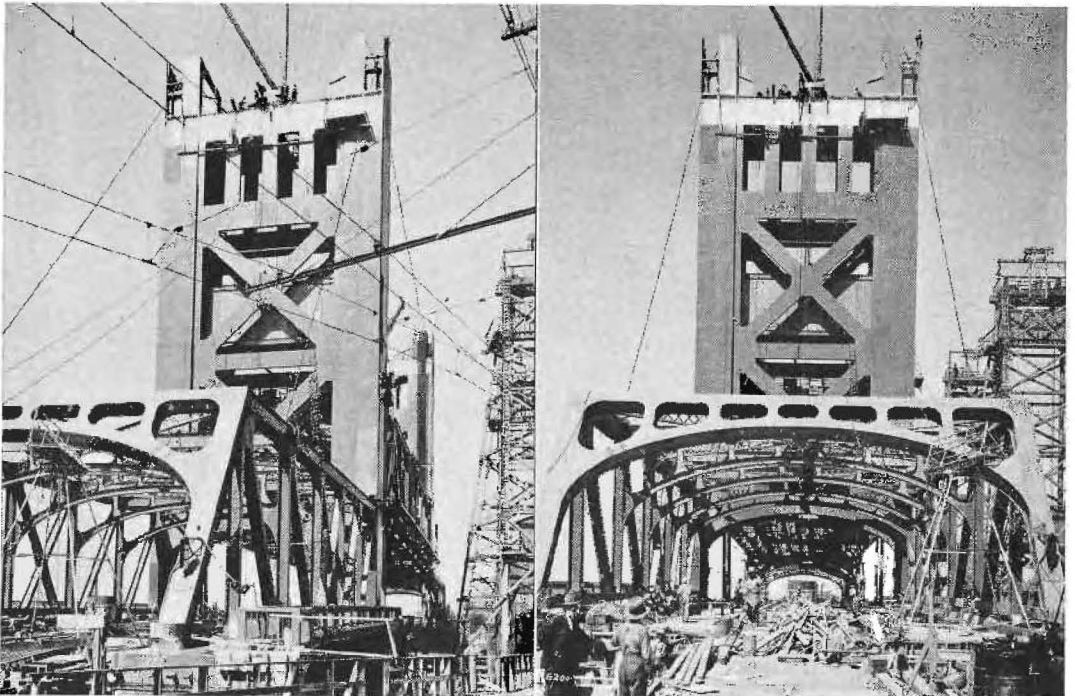
Power for raising the bridge is supplied from two sources. The main motors are two one hundred horse power electric motors and the auxiliary motor is a sixty-seven horse power gas motor. Both sources of power are connected to the main gear box and hoisting drums. All switch boards, controls, and motors are located in the machinery house situated on top and in the center of the lift span.

An elaborate system of signals, sirens, bells, and gates has been developed as a precaution to safeguard the traveling public.

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NEARING COMPLETION, the M Street bridge over the Sacramento River at the State capital is pictured with the 202-foot steel truss lift span in raised position still partially supported by false work.



CONSTRUCTION VIEWS of the tall massive looking lift towers rising 200 feet above the water and the rugged steel deck spans that provide a 52-foot roadway.

State Highways Extensively Damaged by August Storms in Several Districts

A storm period that covered practically the entire State during the last days of August did an unusual amount of damage to the State highways for a late summer storm in Siskiyou, Alpine, Sonora, San Bernardino, Riverside and San Diego counties. Large sections of roadway were washed out, or covered with mud and debris, bridges and drainage structures were broken and automobiles wrecked but without loss of life and in every instance State maintenance crews were able to open the roads to traffic within a few days. The most extensive cases of damage are described in the following reports:

BY E. E. WALLACE
District Engineer, District XI

SINCE the early settlement of the Palo Verde Valley along the Colorado River in the vicinity of Blythe, and the Coachella Valley north of the Salton Sea, until the completion last June of the Indio Cut-off from Indio to Shaver's Summit, the only means of travel between the two valleys in Riverside County on State Highway No. 64 has been through Box Canyon, a narrow rift in the sandstone mountains extending from a point about six miles west of Mecca for a distance of ten miles to the mesa at Shaver's Summit.

During the cloudburst season which occurs from July to October, travel through this canyon has been fraught with danger from the hazards of flood waters which pour through the canyon from a drainage area of over 400 square miles.

COSTLY BIT OF ROAD

Records show numerous floods have delayed light traffic and stopped all heavy trucking in the canyon for various lengths of time. In September, 1929, the road was completely obliterated and trucks and cars caught in the waters were buried and lost. The road was immediately rebuilt and maintained as a dirt road until November, 1933, when the surface was oiled. Numerous small floods occurred during the fall of 1934 which inconvenienced and delayed traffic and made the maintenance of this section very costly.

During the early morning of August 23, 1935, extremely heavy rains fell over the slopes of the mountains both to the south and north of the road between the canyon and Shaver's Summit. The rain started at 4.30 a.m. and had reached the canyon about an

hour later, at 5.30 a.m. The flood reached its peak almost immediately and rushed down the gorge in varying depths from 18 inches to six feet, depending upon the width of the canyon floor. Seven miles of highway were destroyed.

TWO-HOUR FLOOD

It required about one hour for the crest to reach the foot of the canyon. The flow from the upper end was also supplemented by a heavy run-off from Wide Canyon, a tributary draining south from about the middle of Box Canyon. The flow continued for about two hours. Maintenance crews were at the scene of trouble almost immediately after the flood and entered the canyon to render assistance as soon as the waters had subsided sufficiently to permit.

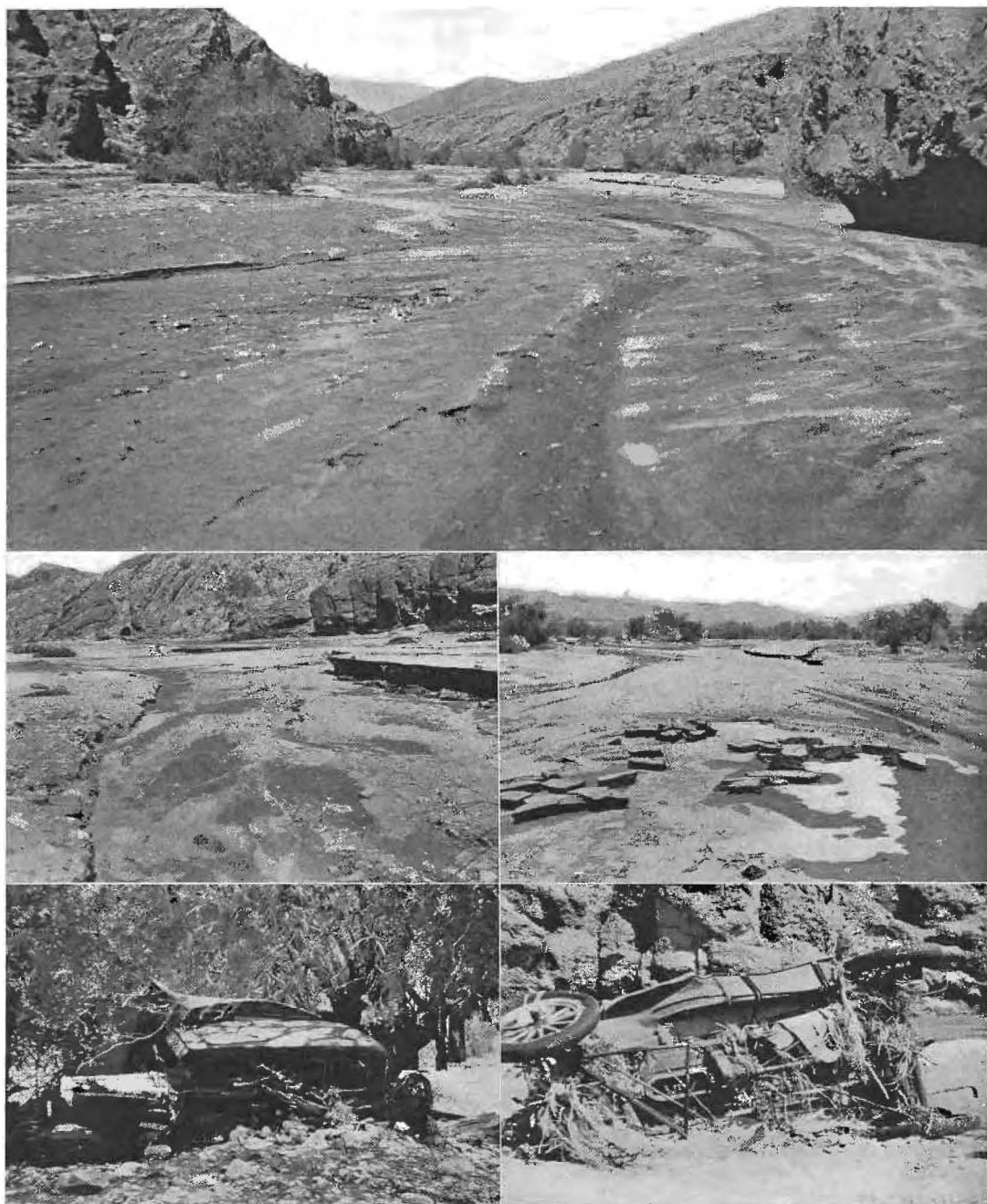
For the past year there has been a tent settlement, at Shaver's Well, of employees from the Metropolitan Water District Project. This was completely wiped out, with the exception of two or three tents and house-trailers which were located on higher points. Approximately eight cars were lost, and two freight trucks were damaged. No lives were lost, one injury was reported and in numerous cases people swam or were washed to safe points.

SHAVER'S WELL ABANDONED

The store at Shaver's Well was ruined, the well caved in and at present the place is being abandoned and the remains of the buildings being moved to other locations. This means a loss of an old landmark, dating back to the days of freighting with mules and wagons.

The proprietor stated that from his past experience he was certain that many lives would have been lost but for the fact that traffic was using the new Indio Cut-off and was not concentrated in the canyon. Due to the new Indio Cut-off, no interruptions whatever occurred to through traffic.

(Continued on next page)



WIPED OUT. Scenes in Box Canyon, Riverside County, where 7 miles of highway on old State Route 64 were destroyed by flood waters August 23d. At bottom, two of eight cars that were wrecked.

(Continued from preceding page)

This being a bond act road, it will be necessary to rebuild it. This section of road is being reconditioned so that it will be traversable. It will require approximately 60 days work and the expenditure of \$15,000.

In the meantime traffic is being handled over the Indio Cut-off, with no inconvenience whatever, except to a small amount of local traffic originating in the territory around Mecca.

(Continued on page 26)

\$21,545,370 in Revised Highway Budget for 87th-88th Fiscal Years

(Continued from page 1)

GREATER EFFICIENCY SECURED

By this underwriting program the State is permitted to apply the Federal funds in practically the same manner as on ordinary or regular State funds improvements, and thus secure greater efficiency by not being obliged to depend entirely on hand labor methods. The State must, however, employ the required number of man-hours of labor from relief rolls and this will be accomplished by spreading relief labor to a number of State financed projects.

As a result of these adjustments, the \$26,498,980 set up in the original budget for major project construction throughout the State, less the $\frac{1}{4}$ cent allocated for cities is reduced to \$21,545,370, the amount now available for major project construction throughout the State.

DIVISION NORTH AND SOUTH

Of this amount, \$11,805,290 is for the north 45 counties and \$9,740,080 for the south group of thirteen counties as apportioned under the provisions of the Breed act and amendments. Projects totaling these amounts are listed in the program.

The total major projects on State highways throughout the State number 126 including 16 projects on State highways in cities.

SEPERATE FEDERAL BUDGETS

Separate budgets are under preparation for the Federal grade separation program of \$7,486,362 and the Federal Emergency apportionment of \$7,747,928 for highway work. The latter program, as submitted to the Federal agencies, includes 33 projects on the State highway system approximating 40 per cent of the road funds; the remaining 60 per cent is distributed approximately equally between county feeder roads and to projects within cities according to Federal requirements and regulations.

The grade separation program is made up of important projects for railroad and highway crossings on city streets, county roads and State highways. Both of these programs require approval of three Federal agencies

STATE NOT CONFINED TO USE OF RELIEF LABOR ON ROADS BY NEW U. S. RULING

BY EARL LEE KELLY, DIRECTOR OF
PUBLIC WORKS

President Roosevelt has approved granting the California State Department of Public Works the right to use other than relief labor on California highway projects financed with the aid of Federal funds whenever such relief labor is not available.

I have received a communication from the United States Bureau of Public Roads informing me of the signing of these amendments to the rules and regulations governing highway construction by Acting Secretary of Agriculture Tugwell and of their approval by President Roosevelt.

The significance of this change in the regulations relative to labor employment means that the Waldo Approach to the north end of the Golden Gate Bridge; Palomar Road, San Diego County; and other important feeder road projects apparently can be financed under Federal Aid.

While the original clause stipulating the use of relief labor only was included as a Federal requirement in such work, the State Department of Public Works did not dare to undertake the projects referred to above for fear that relief rolls might become depleted before the completion of the work, thereby causing the government to discontinue Federal Aid.

We now look forward to the granting of our application for the financing of these improvements upon a basis which we can accept. The amendment approved by the President requires the contractor to employ only persons certified for assignment to work by the U. S. Employment Service with preference in employment being given to persons from public relief rolls when they are qualified for the work.

The amended regulations relieve the State from the original mandatory provision of obtaining all the required labor from those on relief whether qualified for the work or not.

"I understand you've got your divorce, Mandy. Did you get any alimony from your husband?"

"No, Mrs. Jones, but he done give me a first-class reference."—*Elks Magazine*.

before they can be published or any work can be undertaken.

DETAILS OF PROJECTS

The complete details of the major construction projects in the State highway budget and the allocations made for them, based on estimated costs, are given in the following tabulations:

DETAIL OF MAJOR PROJECT ALLOCATION FOR CONSTRUCTION OF HIGHWAYS—
PRIMARY NORTH

County	Route	Location	Approximate mileage	Nature of improvement	Estimated cost	
					Detail	Total
Humboldt	1	Salmon Creek to Bucksport	7.3	Grading and surfacing	\$165,000	
Mendocino	1	Outlet Creek to Reeves Creek	4.5	Grading and surfacing	196,000	
Humboldt	1	Trinidad to McNeil	2.1	Grading and surfacing	125,000	
Mendocino	1	Eleven Oaks Road to Willits	0.8	Grading, surfacing, bridge	60,000	
Del Norte	71	0.7 miles south of State line to 0.5 mile north of Winton Corner	5.1	Grading and surfacing		140,000
Nevada-Placer	37	0.5 miles west of Soda Springs to Donner Summit		Grading and drainage	53,500	
Tehama	29	Route 3 to 1.5 miles east of Dales	13.8	Surfacing	175,000	
Shasta-Lassen	28	Fall River Mills to Nubieber	20	Surfacing	43,000	
Shasta	20	Near Shasta to near Redding	5	Grading and surfacing	220,000	
Tehama	7	Richfield to Red Bluff	13	Grading and paving	270,000	
Plumas-Butte	21	Jarboe Gap to Keddie (portions)		Grading (prison labor)	992,000	
Butte	3	Biggs Road to Chico	19	Grading and surfacing	95,000	
Yolo-Colusa	7	Dunnigan to Arbuckle	8.9	Grading and surfacing	180,000	
Yolo	6	Causeway to M Street Subway	3.5	Grading and paving	170,000	
Yuba-Sierra	25	Nevada City to Downieville (portions)		Grading and surfacing	75,000	
Nevada-Sierra	38	Floriston to State Line	5	Grading and surfacing	50,000	
Sacramento	3	Sacramento to American River	0.3	Grading and paving	50,000	
Santa Cruz	5	Scott Valley to 1 mile north of Santa Cruz	3.9	Grading and surfacing	220,000	
Santa Clara	68	Santa Clara-Alviso Road to San Jose	3.7	Grading, paving, bridge	425,000	
Marin	1	Waldco to Golden Gate Bridge	3.5	Grading, paving, structures	500,000	
Monterey	2	Soledad to Gonzales	8.0	Grading and paving	158,000	
Monterey	2	Thompson Gulch		Grading and paving	27,000	
Fresno	4	Fresno to Ashlan Avenue	4.0	Grading and paving	275,000	
Kings	10	1.5 miles east of Hanford to Hanford	1.5	Grading and paving	60,000	
Solano-Napa	7-8	1 mile north of Carquinez Bridge to Cordelia	11.2	Grading and paving	445,000	
Solano	7	3.5 miles north of Fairfield to 0.6 miles south of Vacaville	3.8	Grading, paving, bridge	202,000	
Stanislaus	4	Turlock to Emar	6.0	Grading and resurfacing	50,000	
Santa Clara	2	State's share Alameda Grade Separation SPRR		Structure (amount due Railroad Co.)	75,000	
Glenn	7	From 4 to 5 miles north of Willows	1.1	Grading, paving, bridge	44,000	
Monterey	2	Bradley to 6 miles south of San Ardo, Hames Creek	6.8	Grading, paving, bridge	335,000	
		Landscaping (Federal Aid Routes)			53,540	
Subtotal						\$5,929,040

CITY PROJECTS

County	Route	Location	Approximate mileage	Nature of improvement	Available		
					From ¼ cent allotment	From regular budget	Total
Humboldt	1	Eureka: Broadway from south city limits to Washash Avenue	1.4	Grading and paving	\$16,900	\$43,100	
Sutter	3	Yuba City: Plumas Street from Sumner to Rio Camino	0.5	Grading and paving	3,000	22,000	
San Francisco-Alameda	5-68-69	San Francisco, Oakland, Emeryville, Berkeley: Bay Bridge approaches		Grading, paving, structures		3,300,000	
Total and subtotal					\$19,900		\$3,365,100
Grand total, Primary North							\$9,294,140

**DETAIL OF MAJOR PROJECT ALLOCATION FOR CONSTRUCTION OF HIGHWAYS—
PRIMARY SOUTH**

County	Route	Location	Approximate mileage	Nature of improvement	Estimated Cost	
					Detail	Total
Santa Barbara	2	Tajiguas Creek to 1½ miles west of Arroyo Honda	3.2	Grading and paving	\$203,000	
Santa Barbara	2	1 mile north of Rincon Creek to Carpinteria and Carpinteria Creek Bridge	1.5	Grading, paving, bridge	125,000	
Santa Barbara	2	Richfield Tower to Santa Maria River	1.5	Grading and paving	65,000	
Santa Barbara	2	Sheffield Drive to Olive Mill Road	1.6	Grading and paving	110,000	
Kern	4	South Boundary to Fort Tejon and Cuddy Creek	5.2	Grading, paving, bridges	440,000	
Kern	4	Famosa Grade Separation approaches and Pose Creek Bridge	1.0	Grading, paving, bridges	60,000	
Tulare	10	Yokohl to Lemoncove	5.0	Grading and surfacing	150,000	
Los Angeles	9	Verdugo Road to Flintridge Country Club	1.4	Grading and paving	150,000	
Los Angeles	9	Pickens Canyon Wash		Bridge	12,500	
Ventura	2	Conejo Grade and Conejo Creek	7.0	Grading, paving, bridge	550,000	
Los Angeles	2	Calabassas to Conejo Grade (portions)		Grading and paving	200,000	
Los Angeles	4	Newhall Tunnel		Grading and paving	100,000	
Ventura	60	Ozard to Hueneme Road	4.9	Grading and paving	73,000	
Ventura	60	Big Sycamore Creek and line change	1.0	Grading, paving, bridge	150,000	
Orange	60	Seal Beach to Newport Beach	10.3	Grading and paving	150,000	
Orange	60	The Arches Grade Separation Routes 60 and 43		Structure, grading, paving	180,000	
Los Angeles	23	Lancaster to North Boundary	10.0	Pavement widening	50,000	
Los Angeles	4	Through Newhall (County Coop. \$31,000)	0.7	Grading and paving	15,000	
Riverside	26	North Boundary to Beaumont	1.5	Grading and paving	77,000	
San Bernardino-Riverside	19	Ontario to Riverside	15.0	Grading and surfaced shoulders	40,000	
San Bernardino	26	Santa Ana Road to Redlands, Mission Storm Drain	5.5	Grading, paving, structure	111,000	
San Bernardino	58	In Barstow		Grading and surfacing	35,000	
San Bernardino	58	Ludlow to 20 miles east of Amboy		Drainage, grading, bridges	20,000	
Inyo	23	Big Pine to Keough Hot Springs	8.0	Grading and surfacing	150,000	
Mono	23	2 miles south of Rush Creek to 3 miles south of Mono Inn	7.5	Grading and surfacing	125,000	
Mono	23	Mattly Ranch to Leevining	2.2	Surfacing	10,000	
Mono	23	4 miles to 1.3 miles south of Coleville	2.7	Grading and surfacing	34,000	
Mono	23	Conway Summit to 1 mile north of Bodie Road (Federal Lands project: F.L. funds \$144,015; State, \$38,600)	4.0	Grading and surfacing	38,600	
Kern	23	Mojave to 10 miles north	10.0	Surfacing	15,000	
San Diego	2	Del Mar to Encinitas	6.3	Grading and paving	245,000	
San Diego	2	Las Flores Underpass to San Mateo Creek	10.5	Grading, paving, structures	480,000	
San Diego	2	Santa Margarita River bridge and approaches	1.0	Grading, paving, bridge	300,000	
Riverside	26	South boundary to Avenue 62	9.0	Storm protection, drainage	78,000	
Imperial	26	3 miles west of Westmorland to Trifolium Canal	4.0	Resurfacing	48,000	
Riverside	26	Indio grade separation approaches	1.0	Grading and paving	50,000	
San Bernardino	58	Java grade separation approaches	2.8	Grading and surfacing	60,000	
San Bernardino	31	Verdemont grade separation approaches		Grading and surfacing	20,000	
San Bernardino	31	Mountain Pass to Nevada State line	15.3	Grading and surfacing	415,000	
Los Angeles	60	Walnut Canyon line changes	0.6	Grading and paving	62,000	
		Landscaping (Federal Aid Routes)			44,880	
Subtotal						\$5,241,980

CITY PROJECTS

County	Route	Location	Approximate mileage	Nature of improvement	Available		
					From ¼ cent allotment	From regular budget	Total
Los Angeles	9	Los Angeles: Foothill Blvd., Scoville Ave., to Osborne Ave., Tujunga Wash	3.0	Grading, paving, bridge		\$235,000	
Los Angeles	60	Long Beach: State Street, Lime Street to Stanley Avenue	1.2	Grading and paving	\$80,000		
Los Angeles	60	Los Angeles: N and O Streets from Wilmington Blvd. to Alameda Street	1.5	Grading and paving right of way	100,000	150,000	
Los Angeles	4	Los Angeles: Marengo and Daly Street, Cornwall Street to Main Street		Right of way	63,000	120,000	
San Diego	12	San Diego: El Cajon Avenue		Paving	106,000	94,000	
Total and subtotal					\$329,000		\$599,000
Grand total, Primary South							\$5,840,980

**DETAIL OF MAJOR PROJECT ALLOCATION FOR CONSTRUCTION OF HIGHWAYS—
SECONDARY NORTH**

County	Route	Location	Approximate mileage	Nature of improvement	Estimated cost	
					Detail	Total
Lake.....	15	Upper Lake to Rasmussen Ranch (Middle Creek Bridge).....	1.2	Grading, surfacing, bridge.....	\$71,000	
Trinity.....	20	Trinity River Road (portions).....		Grading (prison labor).....	165,000	
Trinity.....	20	Oregon Mountain.....	1.8	Grading.....	75,000	
El Dorado.....	11	Kyburia to Strawberry.....	9.0	Drainage and surfacing.....	143,455	
El Dorado.....	11	Lower Crossing Upper Truckee River and approaches.....		Bridges and approaches.....	40,000	
El Dorado.....	11	Oglesby Canyon.....	1.0	Surfacing.....	15,000	
Contra Costa.....	75	Oakland Tunnel to Walnut Creek (portions).....		Grading and surfacing.....	325,000	
Monterey.....	10	Lewis Creek to Priest Valley.....	1.2	Grading and surfacing.....	30,000	
Monterey.....	56	Partington Canyon to Big Sur (portions).....	8.8	Grading (prison labor).....	821,000	
Fresno.....	41	Kings River Canyon (portions).....		Grading (prison labor).....	250,000	
Madera.....	125	Kelshaw to Coarsegold.....	8.0	Grading and surfacing.....	230,000	
		Landscaping (Federal Aid Routes).....			35,095	
Subtotal.....						\$2,201,150

CITY PROJECTS

County	Route	Location	Approximate mileage	Nature of improvement	Available		
					From ¼ cent allotment	From regular budget	Total
Alameda-Contra Costa.....	69	Berkley, Albany, El Cerrito, Richmond: Ashby Avenue to San Pablo Avenue.....	5.4	Grading and paving.....	\$146,500	\$300,000	
Solano.....	74	Benicia: Route 74 in city.....		Grading and surfacing.....		10,000	
Total and subtotal.....					\$146,500		\$310,000
Grand total, secondary North.....							\$2,511,150



CONCRETE PAVER AT WORK on the widened Coast Highway along the Palisades in the Santa Monica beach recreational area in Los Angeles County. This contract provides a 76-foot pavement at a point of heavy traffic where the highway swings from the beach toward the portal of the Colorado Street tunnel now under construction.

DETAIL OF MAJOR PROJECT ALLOCATION FOR CONSTRUCTION OF HIGHWAYS—
SECONDARY SOUTH

County	Route	Location	Approximate mileage	Nature of improvement	Estimated cost	
					Detail	Total
Kern	58	Seivert to Bear Mountain Ranch	14.0	Surfacing	\$20,000	
Kern	58	Tehachapi to Mojave (portions)		Grading and surfacing	100,000	
Kern	142	Kern River bridge and approaches (Isabella)	1.0	Bridge, grading and surfacing	75,000	
Kern	141	Three bridges on Oak Street route		Bridges	20,000	
Kern	140	One bridge, two dips east of Taft		Structures	20,000	
Los Angeles	26	Rio Honda Bridge		Bridge	160,000	
Ventura	138	San Antonio Creek and approaches		Bridge, grading and surfacing	35,000	
Orange	170	Carolina Avenue to Santa Ana River (portions)		Grading and surfacing	110,000	
Los Angeles	166	San Gabriel River Bridge		Bridge	70,000	
Los Angeles	61	Red Box to Mt. Islip (portions)		Grading (prison labor)	300,000	
Los Angeles	158	Sepulveda Blvd., Culver City to Centinella	1.2	Grading and paving	85,000	
Orange	43	Gypsum Creek to east boundary	2.6	Grading, paving, bridges	175,000	
Ventura	153	Camarillo to Oxnard (portions)		Grading and paving	100,000	
Ventura	79	Sespe Ranch to Fillmore and at Piru		Grading and paving	180,000	
Orange	175	Southeast of Placentia	1.0	Grading and paving	36,000	
Orange	179	Santa Ana River and approaches		Bridges	48,000	
Los Angeles	167	Los Angeles River Bridge and approaches, Atlantic Blvd.		Bridge, grading, paving	271,000	
Orange	183	Santa Ana River, Bolsa Avenue		Bridge	50,000	
Los Angeles	168	Rosemead Ave., Whittier Blvd. to Foothill Blvd., (portions) Rio Honda Bridge	10.0	Grading, paving, bridge	350,000	
Los Angeles	168	State Street to Los Angeles (widening)	3.7	Grading and paving	42,000	
Los Angeles-Orange	174	Norwalk to Anaheim	9.3	Grading and paving	75,000	
Orange	43	West boundary to Prado	3.0	Grading and paving	205,000	
Riverside	19	Beaumont to Bad Lands, S.P. grade separation and San Timoteo Creek	2.3	Grading, surfacing, structures	78,000	
Riverside	194	Junction Routes 19 and 194 to new connection and two bridges	2.5	Grading, surfacing, bridges	43,000	
San Bernardino	26	Colton to Waterman Ave., Santa Ana River	1.9	Grading, paving, bridges	330,000	
San Bernardino	190	Indian Creek		Bridge	10,000	
Riverside	77	Santa Ana River and Chino Creek Bridge and approaches		Bridge	40,000	
Riverside	78	Tamecula Creek, Mile Post 72.3		Bridge	14,000	
Inyo	127	Six miles west of Darwin to Panamint Sink	18.0	Grading and surfacing	25,000	
Kern	145	Searles to Randsburg	6.7	Grading and surfacing	9,500	
Inyo	127	Eichbaum Toll Road		Purchase	18,900	
Riverside	64	Ehrenberg Bridge		Purchase	45,000	
Imperial	187	Holtville to Brawley (portions)		Surfacing	104,000	
San Diego	77	Lake Hodges to Escondido	3.1	Grading and surfacing	85,000	
Imperial	202	Midway Wells to Calexico (portions)		Grading, surfacing, bridges	100,000	
Imperial	187	Brawley to Calipatria (portions)		Grading, bridges	75,000	
Los Angeles	167	Atlantic Blvd., Southgate to Bell (County cooperation \$21,000)		Grading and paving	32,000	
Los Angeles	174	Manchester Blvd. through Downey (County cooperation \$55,000)		Grading and paving	62,000	
		Landscaping (Federal Aid Routes)			29,820	
Subtotal						\$3,628,320

CITY PROJECTS

County	Route	Location	Nature of improvement	Available		
				From ¼ cent allotment	From regular budget	Total
Orange	174	Ansheim: Manchester Blvd. from Lincoln St. to south city limits	Grading and paving	\$7,600	\$75,000	
Los Angeles	158	Los Angeles, Culver City: Sepulveda Blvd. (portions)	Grading, paving, structures } C.C. ures } L.A.	7,150		
				47,070	195,780	
Los Angeles	102	Los Angeles: Santa Monica Blvd., Heath to Sepulveda	Grading, paving, structures	350,000		
Los Angeles	165	Los Angeles: Figueroa Street (portions)	Grading, paving, structures	481,930		
Los Angeles	172	Los Angeles: Fourth Street, Indiana to Fresno	Grading and paving	50,000		
Los Angeles	173	Los Angeles: Tenth Street (portions)	Grading and paving	250,000		
Total and subtotal				\$1,193,750		\$270,780
Grand Total						\$3,899,100
Grand Total, primary and secondary						\$21,545,370



Concrete Arch Span Over Malpaso Creek

ANOTHER concrete arch bridge has been completed on the San Simeon-Carmel highway along the Monterey coast.

The new bridge which spans Malpaso Creek, five miles south of Carmel, is 210 feet long with a main span of 117 feet and has a 24-foot roadway with sidewalks on either side. At this location excellent foundations were available for the abutments, so that this was an economical location in which to use a concrete arch.

As shown in the accompanying photographs, the background forms a beautiful setting for this arch bridge so that both an economical and architecturally beautiful structure was secured.

OLD BRIDGE DANGEROUS

This bridge replaces an old narrow combination truss span 206 feet long on very poor alignment which was not safe for legal loads. The curves approaching the bridge at each end were of short radius. The bridge was built many years ago by Monterey County when this highway was a winding, twisting, narrow road from Monterey to Big Sur.

In the past few years the highway has been improved to modern standards and this bridge was the last remnant of the old highway in the twenty-five miles immediately

south of Carmel. The sharp approach curves at both ends of the bridge therefore formed a dangerous hazard and caused numerous accidents.

The new and the old highway intersect at the south end of the bridge. In order to take care of traffic during construction, the south end of the old truss bridge was shifted approximately 32 feet east. The shifting of this old combination truss without undue delay to traffic required careful planning and careful work, and was accomplished without accident.

The total cost of the work of constructing this new bridge, including the shifting of the old truss for detour and the construction of the necessary approaches, was approximately \$24,000.

I. T. Johnson was resident engineer.

Drunk (bumping into lamp post)—Excuse me, sir. (bumping into fire hydrant): Excuse me, little boy. (bumping into second lamp post and falling down): Well, I'll just sit here until the crowd passes.

State health bulletin warns against kissing as a means of communicating colds. But it must mean platonic kisses. The others burn up the germs.—*Philadelphia News*.

Analysis of Laws Affecting State Highways Enacted by 1935 Legislature

By **ROBERT E. REED**, General Right of Way Agent

THE 1935 session of the California legislature had before it many measures affecting the State's highway system, and, as has been true in previous sessions, the legislature definitely indicated that California should and would continue on substantially its present program of an orderly expansion of state highways.

Inasmuch as the bulk of the 1935 legislation becomes effective on September 15, 1935, it is well at this time to analyze the measures which most directly affect the state highway program and the activities of the Department of Public Works in connection therewith.

CODIFICATION OF LAWS

The California Code Commission prepared two of the measures enacted by the 1935 session that will prove of great benefit to every one interested in highway matters. These measures are known as the Streets and Highway Code (Senate Bill 147, Chapter 29, Statutes of 1935) and the Vehicle Code (Assembly Bill 170, Chapter 27, Statutes of 1935).

The Streets and Highway Code is a restatement of the various previously existing statutes relating to state and county highway matters. The code brings together in one statute all of these provisions and repeals the numerous enactments heretofore in effect. The code itself makes no substantive changes.

The Vehicle Code is a similar codification of the laws relating to motor vehicles and the regulation of traffic on highways.

Inasmuch as these two measures were enacted early in the session, the substantive changes made by the 1935 legislature were, in the main, amendments to the two codes. The codes were carefully checked during the course of their preparation by the Department of Public Works and it is believed they

will be of inestimable benefit in providing easy access to all of the law affecting state and county highways.

SAN FRANCISCO-OAKLAND BAY BRIDGE

Legislation enacted by the California legislature in 1929, 1931, and 1933 provided for the financing and construction of the great San Francisco-Oakland Bay Bridge. To make possible the financing and equipping of the bridge with the facilities necessary to provide interurban transportation, the 1935 legislature enacted Assembly Bill 947 (Chapter 228, Statutes of 1935) at the request of the California Toll Bridge Authority and the Department of Public Works.

This bill amends the California Toll Bridge Authority Act and authorizes the Department of Public Works, under the direction of the California Toll

Bridge Authority, to acquire or construct transportation facilities in connection with toll bridges acquired or constructed under the act. It authorizes the same methods of financing such interurban facilities as have previously been made available for financing bridges designed solely for vehicular traffic.

The bill makes it possible for the state to obtain a further loan from the Reconstruction Finance Corporation in the sum of \$10,000,000, as well as to use savings made in the construction of the portion of the bridge devoted to vehicular traffic, for the construction of interurban facilities. The R. F. C. has granted the loan of \$10,000,000, and all impediments in the way of providing adequate interurban service between San Francisco and the East Bay area have been removed.



ROBERT E. REED

Highway Funds Applied to City Streets

(Continued from preceding page)

Assembly Bill 1339 (Chapter 847, Statutes of 1935) provides for the policing of the bridge by the California Highway Patrol and contains certain detailed provisions relating to the collection of tolls by the Department of Public Works. Special traffic regulations made necessary by the physical characteristics of the bridge are also included.

HIGHWAY FUNDS

In 1933 the people of California decisively voted against the diversion of highway funds for other governmental purposes.

This sentiment was also present in the 1935 session of the legislature, with the result that the funds to be devoted to highway purposes were not disturbed. There were four measures affecting State highway funds which deserve mention:

FOR CITY STREETS

Senate Bill 561 (Chapter 642, Statutes of 1935) provides that the net revenue from one-quarter cent per gallon tax on motor vehicle fuel shall be expended by the State upon city streets of major importance, other than state highways. Under this bill, an allocation is made to each city based upon its population. Provision is made for the delegation of the expenditure of the moneys to the city in each instance where the Department of Public Works is satisfied the city is equipped efficiently to handle the expenditure. The allocation for city streets is in addition to the present allocation for State highways within cities.

The moneys can be expended only upon projects which have been first submitted to and approved by the Department of Public Works. The measure will make available to cities approximately \$6,000,000 a biennium and will remove from the backs of the local taxpayers this much of their present burden, as this is the first time the State has contributed to the construction and maintenance of city streets other than state highways. Heretofore this expense has been borne solely by the taxpayers of the cities.

FEDERAL AID WORK

At the request of the Department of Public Works Assembly Bill 2433 (Chapter 360, Statutes of 1935) was enacted to enable the State to take full advantage of the moneys made available by the Federal government for highway and grade crossing projects. Under this bill the State is authorized to advance the necessary funds to complete the projects for which Federal funds are available and for which the State will be reimbursed.

The State is authorized to comply with all Federal laws, rules, and regulations imposed upon the expenditure of these moneys. These regulations require that a portion of the money must be expended on other than State highways. The Federal rules and regulations, however, require that all of such money be expended through the State highway departments in the various states.

This bill, therefore, provides that the State is authorized to do the necessary work on streets and highways other than State highways. State money

can be advanced for such projects, however, only to the extent that full reimbursement will be obtained from the Federal government.

DIVERSION PROHIBITED

Assembly Bill 313 (Chapter 262, Statutes of 1935) guarantees the return to the State highway fund of any moneys taken for the support of the school system under the provisions of section 15 of Article XIII of the Constitution. The constitutional provision, which thus far has never been used, provides that the support of the schools constitutes a first lien on all State revenues. It has been contended that this provision applies to State highway funds. This bill does not disturb this provision but requires the repayment into the State highway fund, as well as all other special funds, any moneys thus taken therefrom.

Assembly Bill 444 (Chapter 624, Statutes of 1935) increases the minimum quarterly apportionment to counties from \$5,000 to \$7,500.

CONTROL OF HIGHWAYS

No major changes were made in the weight limitations applicable to highways. Assembly Bill 1295 (Chapter 524, Statutes of 1935) increases the permissible weight of 2-axle trucks where the axles are thirteen feet or more apart, from 22,000 to 26,000 pounds. This measure will not be detrimental to the State highways for the reason that 3-axle trucks at the present time are permitted to exceed this limitation.

Senate Bill 626 (Chapter 384, Statutes of 1935) was introduced at the request of the Department of Public Works to authorize the limitation of weights on certain of the secondary highways where such highways are not at present built to withstand the maximum load permitted by law. The bill was considered necessary to protect the county roads taken into the State System in 1933. Many of these roads are of light construction, and the State has yet had neither the necessary time nor funds with which to improve them to an adequate standard. The weights permitted on a highway or portion thereof can not be reduced below 16,000 pounds, and no limitation below that now prescribed by law can be imposed until an engineering investigation has been made and a public hearing held.

PARKING ON STATE HIGHWAYS

Senate Bill 788 (Chapter 714, Statutes of 1935) amends many sections of the Vehicle Code above mentioned. Included in the bill is the addition of Section 588 to the Vehicle Code, providing that except when loading or unloading merchandise all vehicles parked on state highways must be parked parallel to the curb or edge of the roadway. It is believed that this measure will aid materially in reducing heretofore existing "bottle necks" in many of the cities, particularly where the State highway constitutes the main street in the city.

FRANCHISES

Assembly Bill 650 (Chapter 631, Statutes of 1935) was introduced at the request of the representatives

(Continued on page 22)

New Road to San Juan Bautista, Old Mission Town, Opened to Traffic

By L. H. GIBSON, District Engineer

UPON the completion in 1932 of the San Juan Grade elimination project north of Salinas, locally known as the Prunedale Cut-off, the picturesque mission town of San Juan Bautista found itself some three miles off the main traveled Coast Highway. The motorist wishing to visit the historic mission in the town was compelled to travel over the old and dangerous San Juan Grade, or over an old winding graveled county road, known as the "Rocks Road" because of its origin at the Pinecate Rocks through which the new Prunedale Cut-off runs.

The motorist from the south or the Monterey Peninsula district, going to the San Joaquin Valley via the Pacheco Pass, was also obliged to travel over this same grade, or the inferior county road, or go on to Gilroy and thence over the Pacheco Pass.

In order to provide a somewhat better connecting road from the Prunedale Cut-off to San Juan Bautista, the 1933 Legislature made the above-mentioned "Rocks Road" a part of the State Highway System, and it was immediately temporarily improved by applying an oil and screenings seal until a more satisfactory connection could be provided.

COMMISSION HEEDED REQUEST

Led by the able and eloquent Father Caffrey of the Mission San Juan Bautista, public spirited citizens asked the Highway Commission to provide a more direct and adequate connecting road. As soon as funds were available the Commission acted favorably upon this request and made the necessary allocation during the past biennium for the construction of such a connection, which is now completed and opened to traffic.

This connection, 2.6 miles in length, known as the "Rocks Road," runs easterly from a point on the Prunedale Cut-off, two miles northeasterly from the Pinecate Rocks, to the town of San Juan Bautista. The road skirts the northerly edge of the Gabilan range of mountains over which the old San Juan Grade wound its way and eliminates any mountain driving for the traveler wishing to visit the Mission San Juan or desiring to proceed easterly to Hollister and thence to San Joaquin Valley points.

FEDERAL FUND PROJECT

The road has a standard 30-foot roadbed, with minimum 1500-foot radius curves except for one curve in the town of San Juan, and is surfaced with a 20-foot 4-inch crusher-run base and a 20-foot 3-inch road-mixed oil surfacing and seal. The grading and surfacing of the road has been completed at a cost of about \$62,000 the project being financed from the 1935 Federal appropriation of U. S. Public Works highway funds.

A feature of the work, when completed, will be the landscaping of a broad "Y" intersection with the Coast Highway. The central portion of the "Y," between the traveled ways, has been left a foot or two above the road bed and will be enclosed with an adobe wall and rustic gates typical of the Spanish motif. Within this wall will be placed an appropriate directional marker indicating the San Juan Mission.

CAMPANILE AND CROSS

Along the outside edge of the two entrances, adobe walls will also be constructed. Back of these walls a generous right of way has been obtained, and the intervening area somewhat raised above the roadbed and will be planted with appropriate trees and shrubs. Within the park area to the north will stand a Campanile of mission design and in the southerly park area a large rough hewn redwood cross, both features being emblematic of the San Juan Mission to which the road directly leads.

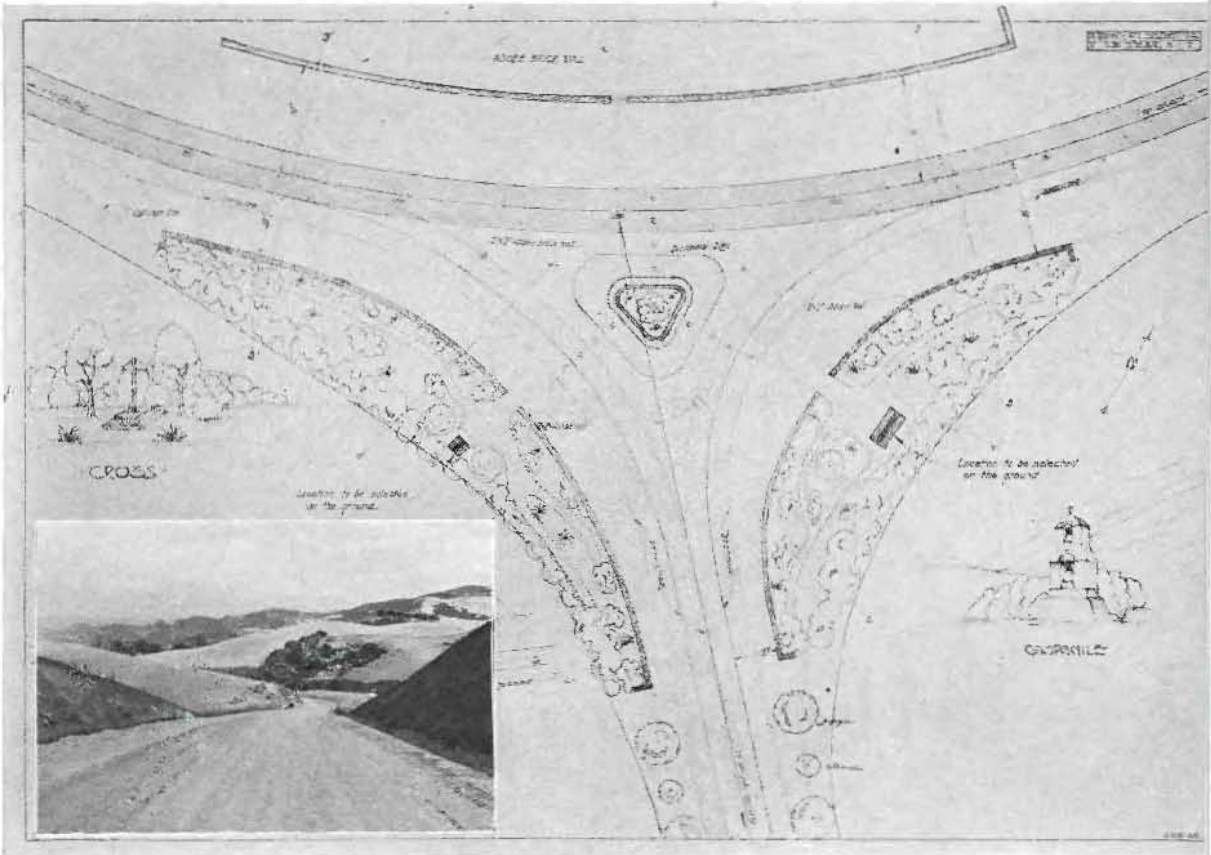
Across the main highway to the west, and opposite the new road, is planned a high adobe brick wall with a rustic entrance gate, and the area behind will be planted with trees and high shrubs.

The landscaping work at the "Y" is yet to be undertaken and will be financed from one per cent of the Federal allocation for road construction in 1935 specified for use in highway beautification projects.

The new road, which by act of the 1935 Legislature, is made a part of the primary highway system, should be a time saver and be much safer for the motorists traveling from valley to the sea. When completed, this landscaped intersection should prove a beckoning influence to the motorist to pause in his travels long enough to visit this old shrine and its quaint village.



CROSS AND CAMPANILE will mark this intersection of the new road to the mission town of San Juan Bautista with the Prunedale cutoff.



BEAUTIFICATION PLAN to include emblematic structures and adobe wall at intersection pictured above. Inset shows portion of new State Route to San Juan Bautista.

Dedication of Redwood Highway Sector

(Continued from page 2)

Crescent City and Del Norte County. General Chairman H. G. Ridgway presided as master of ceremonies.

TWO GOVERNORS REPRESENTED

Edward J. Neron, Deputy Director of the State Department of Public Works, officially represented Governor Frank F. Merriam and Earl Lee Kelly, Director of Public Works.

State Senator John D. Goss of Oregon officially represented Governor Charles H. Martin of that state.

Other speakers included: Alexander Popper, President Crescent City Chamber of Commerce; Supervisor J. J. McNamara, representing the Del Norte County Board of Supervisors; Assemblyman M. J. Burns, representing Humboldt, Del Norte and Mendocino counties; President M. Goldman, Vice President G. E. Frevert and A. E. Dalton of Redwood Empire Association; Oscar Goodcell, Automobile Club of Southern California; Robert Thomas, Maintenance Engineer, representing J. W. Vickrey, District Engineer, Division of Highways, Eureka; State Senator James Chinock of Oregon; Newton B. Drury, representing the State Park Commission, and L. V. Campbell, Engineer of Cooperative Projects, Division of Highways, Sacramento.

CHRISTENING CLIMAXED PROGRAM

Climax of the day's program was the christening of the new highway sector with a bottle containing waters from the Klamath and Smith Rivers and the Pacific Ocean.

The celebration was sponsored by the Del Norte County, Crescent City, Smith River and Klamath Chambers of Commerce and the Redwood Empire Association.

The new highway has been constructed to standards of width, grade and alignment which, estimates of future traffic density indicate, will be adequate for some years.

Seven miles of this nine mile section follows closely along the top of a ridge parallel to the coast from 600 to 1100 feet above the ocean, through a dense virgin redwood forest. Three miles of this area lies within the California State Park System, where the forest will be preserved in its natural state.

OLD ROAD MAINTAINED

The old road also traverses this park area at a lower elevation where it will be maintained and serve as a park road.

The entire roadway has been surfaced with nine to twelve inches of crushed rock and provision made for successive applications of oil as required.

Several large slides have occurred which have brought the total excavation to in excess of 700,000 cubic yards. These slides have been removed for a safe distance from the shoulders. They continue to move, however, and no doubt will be a considerable factor in maintenance cost for a few years.

SLIDE MENACE CEASING

But the soil is such that they will gradually cease to move and will not become the perpetual menace and source of expense encountered along the so-called Crescent City Bluffs or the old highway.

The new road leaves the forest area five miles south of Crescent City at an elevation that affords a panoramic view of the Smith River Valley and the rugged coast line for many miles toward the east and north.

The construction work was done by contract under the supervision of the District I engineers of the Division of Highways.

SODA POP PAYS \$3,495,000

GAS TAX ON 50,000 AUTOS

Gasoline and carbonated beverages are closely related, at least so far as taxation is concerned.

This is interestingly demonstrated by the American Petroleum Industries Committee in a recent statement which reads, in part, as follows:

"Recent estimates reveal that the carbonated beverages industry pays something like \$3,495,000 annually on the 75,000,000 gallons of gasoline consumed by the 50,000 motor vehicles which transport the beverages from manufacturers to consumers. An additional \$73,571 in federal taxes is paid on the 7,357,150 quarts of lubricating oil consumed by the beverage trucks.

CALIFORNIA HIGHWAYS AND PUBLIC WORKS

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

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

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

Vol. 13 SEPTEMBER, 1935 No. 9

Traffic Creates Problem

One of the major traffic blocks on the southern section of the Coast Highway, that through the Laguna Beach business district, is to be relieved to a certain extent, at least, by the new law of the State that parallel parking must be put into effect on all State highways.

Unfortunately for Laguna Beach and coast traffic between Long Beach and San Diego, the Coast Highway also makes a considerable turn in the center of the Laguna Beach business district, which lies between two hills. All of these factors, coupled with the fact that Laguna Beach is one of the busiest communities along the coast these days, complicate the problem. Naturally, Laguna Beach does not want heavy traffic whizzing through its business district to endanger shoppers and others. Yet the slowly moving string of irritated motorists through that street this summer was not pleasing, either to the city or to the drivers. Intersection regulation, on at least one intersection, may be necessary, but will not solve the problem, it is feared. Removal of angle parking will help, not because it will permit high speed, but because it will relieve congestion of through traffic occasioned when parking motorists back out into the center of the coast highway, a constantly recurring irritant on busy days.—*Long Beach Press-Telegram.*

Cub Reporter: "I'd like some advice, sir, on how to run a magazine."

Editor: "You've come to the wrong person. Ask one of my subscribers."

"Sir, I wonder if you'd help a girl in trouble?"

"Sure, what sort of trouble do you want to get into?"—*Rotary Reminder.*

Gas Tax Revenues Show 6.8% Increase for Six Month Period

GASOLINE tax assessments for the month of July, 1935 exceeded those of July 1934 by 42.76%. The figures are as follows:

July 1935.....	\$4,351,472	
July 1934.....	3,048,038	
Increase	\$1,303,434	42.76%

Since the assessments for July, 1934, were abnormally low, and for July, 1935, abnormally high, the above rate of increase does not have a great deal of significance. The trend of gasoline sales is unquestionably upward but not at the rate which might be indicated by the July comparison. Assessments for the first seven months of this year and last should provide a fair basis for comparison. The figures are:

Jan. 1, to July 31, 1935.....	\$24,714,121.51	
Jan. 1, to July 31, 1934.....	23,114,129.51	
Increase	\$1,599,992.00	6.8%

A three month comparison might be made as follows:

May 1, to July 31, 1935.....	\$11,741,265	
May 1, to July 31, 1934.....	10,026,772	
Increase	\$1,714,493	17.01%

TRUCKS AID FLOOD VICTIMS IN DRINKING WATER SHORTAGE

An acute emergency existed during the recent floods in New York state when pure drinking water had to be provided speedily for large numbers of persons who were in almost inaccessible places.

Responding to a plea by Governor Lehman, milk truck operators placed their equipment in emergency service as soon as delivery of milk in the tanks had been effected.

Filled with water, the tank-trucks were sent into the stricken areas, their drivers overcoming many obstacles and difficulties as they made progress over flood-attacked highways and roads. In addition to the loads of fresh water, many of the trucks also carried supplies of food and other necessities.—*Highway Highlights.*

"John," she said, "I've got a lot of things I want to talk to you about—"

"Good," said her husband, "I'm glad to hear it. Usually you want to talk to me about a lot of things you haven't got."—*What Cheer.*

Approximately 3560 miles of modern highways have been built in eight central and southeastern provinces of China since May, 1932.

Russia in 1935 plans to manufacture 92,000 passenger automobiles, 20,000 trucks and 15,000 tractors.

Safety Method of Boring Yerba Buena Tunnel Leaves Core to be Removed

MORE than 350 feet of the 540-foot Yerba Buena Island Tunnel is now completely lined with concrete of a minimum thickness of four feet on its side walls and a minimum thickness of three feet over its crown, according to Chief Engineer C. H. Purcell's last report to State Director of Public Works Earl Lee Kelly.

Bids on Contract 5, Yerba Buena Crossing, including island anchorage, tunnel, piers, concrete viaduct, and the relocation of certain existing roads and buildings, were opened March 28, 1933, and the low bidder was awarded the contract for \$1,821,129.50.

The crossing of Yerba Buena Island, a military and naval reservation, occupying a 400 acre outcropping of sandstone, is by means of a reinforced concrete viaduct, four 288-foot steel truss spans, and a 540-foot tunnel.

WORLD'S LARGEST BORE

The main vehicular tunnel, without its concrete lining, will be 76 feet wide by 58 feet high making it the largest bore tunnel in the world. It will accommodate two traffic decks. The upper deck will have six lanes for fast automobile travel; the lower deck will have three lanes for heavy trucks plus two tracks for interurban trains.

A tunnel was chosen for this portion of the work rather than an open cut because the very high and steep side slopes of the latter would have created the hazard of dangerous slides. In addition, such a cut would be a restriction to the best use of the island by the government agencies occupying it, and would have created an unsightly scar.

PRECAUTIONS AGAINST CAVE-INS

In constructing the tunnel it was anticipated that the rock for the first 200 feet from the west portal would be somewhat broken and incapable of supporting itself. Cement grout under as much as 300 pounds pressure was pumped into twenty-five 1½ inch holes which were bored horizontally into the rock and over the crown of the tunnel before any digging was started. By this means the rock was sufficiently strengthened to facilitate driving the bore.

When completed the tunnel will be continuously lined. The roof will be supported by 16-inch steel arch ribs spaced every three

feet. This steel will be embedded in concrete with a crown thickness of three feet.

Due to the large cross section and short length of the tunnel, no mechanical ventilation is provided.

In the construction of the main vehicular tunnel, the open portals at both the east and the west ends were first excavated.

NOVEL METHOD PURSUED

A novel method of excavating the world's largest bore tunnel was conceived by Chief Engineer Purcell of the San Francisco-Oakland Bay Bridge and his staff, the novelty of which consists chiefly in that they first build the tunnel and then dig it out.

Three bores were drilled through the island for the tunnel. The three bores, two at either lower side and one in the crown, are blocked out into a horseshoe-shaped excavation through the rocky island. This horseshoe-shaped excavation is then concrete and steel lined from three to five feet thick before the inside or core of the tunnel is dug out.

With the tunnel completely lined for most of its length of 540 feet, a power shovel enters the portal to remove the thousands of cubic yards of rock within this 58 by 76 foot bore. Through this bore a four-story building could be pulled upright.

In the photo a huge power shovel may be seen dwarfed by the size of the mouth of this tunnel through which 30,000,000 vehicles and 50,000,000 train passengers can speed annually after the opening of the bridge by Governor Frank F. Merriam in the fall of 1936.

Marshal: "Yes, this is the fire department. Do you want to report a fire?"

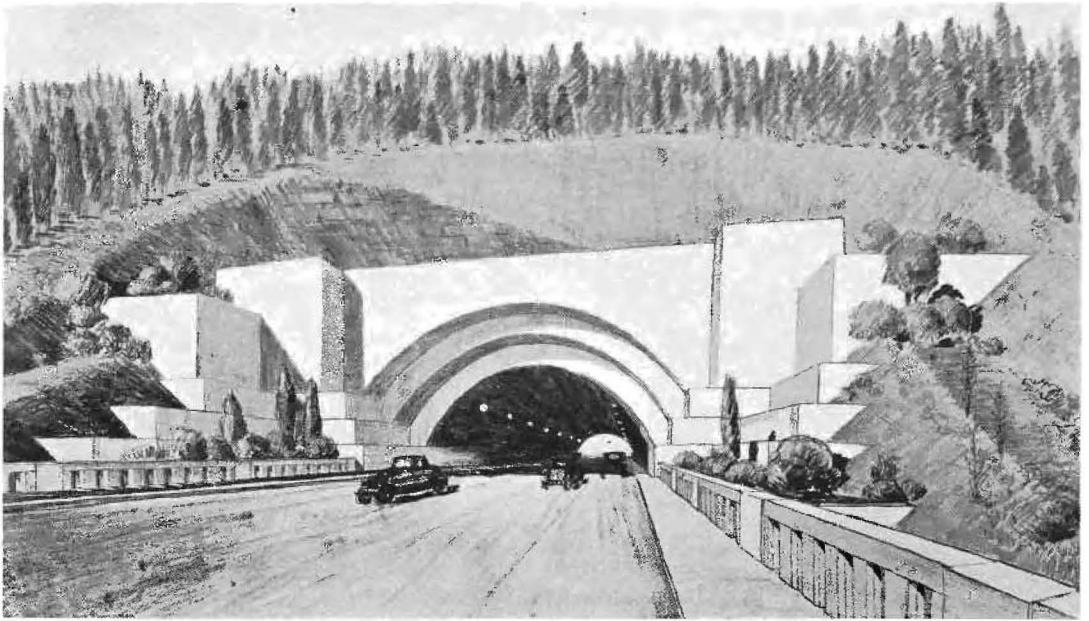
New Bride: "Oh, no; I just want to order coal and wood for the winter."

Wife (reading from paper)—"Here's an old hen they've found with two hearts."

Husband—"Yeah? Well, I played bridge with her the other night."—*Border Cities Star*.

He—"Who spilled mustard on this waffle, dear?"
She—"Oh, John! How could you? This is lemon pie."—*Wise Cracks*.

It's perfectly all right for a woman to hang on to her youth, but not while he's at the wheel.



YERBA BUENA ISLAND TUNNEL of San Francisco-Oakland Bay Bridge project as it will appear when completed.



DOWN TO THE CORE. With the tunnel completely concreted and steel lined by novel construction methods a steam shovel begins removal of thousands of cubic yards of rock from 58 by 76-foot bore.

Law Fixes Control of Signals on State Highways in Cities

(Continued from page 15)

of the counties and cities. It was discussed and worked out with the Department of Public Works. It provides that franchises heretofore granted by cities or counties to public utilities for the use of streets or highways which have since been taken into the State highway system shall remain effective, but the State is empowered to enforce all of the provisions of the franchises regarding the care and maintenance of the facilities on the highways. The revenues from these franchises, under the bill, will be retained by the counties or cities concerned.

TRAFFIC SIGNS AND SIGNALS

Assembly Bill 1654 (Chapter 590, Statutes of 1935) provides that the approval of the Department of Public Works must first be obtained before any stop sign or traffic control signaling device can be erected or maintained by local authorities in such a manner as to interfere with traffic on State highways within cities.

CONSTRUCTION AND MAINTENANCE

CONTRACTS

There was but one minor change made in the State Contract Act, that relating to the publication of notices for bids. The former law provided for the publication in two trade journals, one published in San Francisco and the other in Los Angeles. Senate Bill 236 (Chapter 533, Statutes of 1935) provides that the publication shall be as formerly provided or, in the discretion of the Department, in one trade journal and in a local newspaper.

Assembly Bill 545 (Chapter 322, Statutes of 1935) permits common carriers to grant free or reduced rates to contractors upon public work.

Senate Bill 233 (Chapter 837, Statutes of 1935) repeals the so-called alternate bid law which was enacted in 1933.

No action was taken by the 1935 legislature to extend the effective period of the thirty hour week, the California Industrial Recovery Act, or the supplement to the California Industrial Recovery Act. None of these statutes, therefore, is now in effect.

CONVICT LABOR

Technical changes in the procedure to be followed in the employment of convict labor were made by Assembly Bill 713 (Chapter 733, Statutes of 1935). Little change in the existing procedure is necessitated by the new law.

MISCELLANEOUS

Senate Bills 234 and 235 (Chapters 305 and 306, Statutes of 1935) authorize the State to purchase water from mutual water companies without subscribing to stock in the companies. Under the State Constitution the State is prohibited from owning stock in any private corporation and heretofore considerable difficulty has been encountered in obtaining water from these mutual water companies, as they have heretofore sold water only to their stockholders.

Assembly Bill 630 (Chapter 514, Statutes of 1935) makes many minor changes in the Streets and Highways Code.

M Street Bridge Will Be Opened to Traffic in November

(Continued from page 4)

All mechanisms are electrically operated from the machinery house with the exception of a few signals which will be operated by the watchman stationed at the east end of the bridge. All machinery has been placed but not put into operation. However, it is expected that in the very near future the lift span will be lowered to its resting position and the concrete deck placed.

PLANTING WEST APPROACH

In line with the present state policy of beautifying state projects, some 2,000 feet of the west approach will be planted with trees and shrubbery.

It is expected that railroad traffic will be turned onto the new bridge, the latter part of October and highway traffic the latter part of November. Work must be carried out in this order, as part of the detour now being used by the railroad must be torn out before part of the rear abutment can be finished.

CHANGES IN AND ADDITIONS TO THE STATE HIGHWAY SYSTEM

The changes in the State highway system were relatively few at this session. In several instances substitutions in the secondary system were made. In other instances the existing descriptions were clarified. Space does not permit the explanation in detail of each of these changes, but reference is made to the following chapters of the 1935 statutes: 274, 426, 427, 429, 513, 626, 630.

Assembly Bill 2080 (Chapter 634, Statutes of 1935) authorizes the acquisition of the Muir Woods toll road.

OTHER ENACTMENTS

There are many other enactments of the 1935 session which affect highway administration, and the foregoing are listed merely because they seem to be of major importance. Reference should also be made to the following 1935 statutes:

Assembly Bill 61, Chapter 460—Technical changes in Outdoor Advertising Act relative to exempted signs.

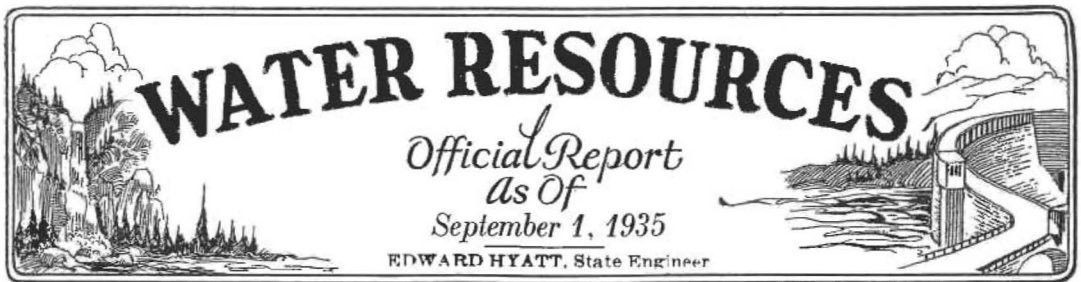
Assembly Bill 800, Chapter 390—Imposing an additional limitation of loads on light trucks.

Assembly Bill 838, Chapter 689—Authorizing a new procedure to be followed in changing the grade of a State highway within a city.

Senate Bill 101, Chapter 164 (See also Senate Bill 561, Chapter 642, which contains a similar provision)—permitting apportionments to cities incorporated since the last census.

Senate Bill 822, Chapter 263—Changing the definition of maintenance.

In conclusion it must be stated that highway matters and those interested therein were given every consideration by the 1935 session of the legislature.



A loan of \$8,600,000 has been granted by the Reconstruction Finance Corporation to Merced Irrigation District to be used in refunding a bonded indebtedness of \$16,191,000. This is the largest single loan granted by the corporation to irrigation districts in this state.

Revised plans for San Gabriel Dam No. 1 in Los Angeles County have been approved and construction is proceeding on five dams in the Santa Clara Valley Water Conservation District.

Other news of the irrigation districts, flood control and reclamation projects, dam applications, water distribution and stream flows is given in the regular monthly report of the State Engineer as follows:

IRRIGATION DISTRICTS

At request of the directors of Hollister Irrigation District, San Benito County, a meeting was held with the board to consider problems confronting the district. Among these is the realignment of boundaries of the district and revision of plans for a water supply.

The contract has been let and work is in progress on the construction of a storage dam West Branch, South Fork of Pit River. Storage back of this dam will provide water for the South Fork Irrigation District, Modoc County.

An election on the organization of the North Kern Water Storage District has been called by the State Engineer for October 8th.

Districts Securities Commission

Action on the petitions of various irrigation districts to the California Districts Securities Commission is shown in the following orders issued by the commission to the districts:

East Contra Costa: Approval of refunding bonds for certification by the State Controller; exchange of refunding bonds.

Newport Heights: Approval of refunding bonds for certification by the State Controller.

Paradise: Approval of amended plan of debt readjustment.

FLOOD CONTROL AND RECLAMATION

Maintenance of Sacramento Flood Control Project

Maintenance work has proceeded with a small crew. The small irrigation plants for the willow planting have been put in service, and the ditches have been cleaned by relief labor from Federal Transient Camp Weir No. 8.

Relief Labor Work

New applications have been submitted to the Works Progress Administration covering clearing in the bypass and overflow areas. It will probably be some time before these applications are passed upon, but it is expected that relief labor in quantity will not be available before October 15th in the Sutter and Yuba County area.

Sacramento Flood Control Project

Work has commenced on the construction of a bridge for the Reclamation Board on the Charles Seavers property north of Colusa. Piles are being driven by our own maintenance driver. In addition to the bridge, four large culverts are to be installed in this vicinity, and the supports of the Cheny Slough Irrigation Company flume, where it crosses the borrow pit, are being reconstructed. The entire estimated cost of this job is \$3,700.

Considerable work has been done in conjunction with the Reclamation Board in connection with the new program for bank protection, levee and construction as inaugurated by General Jackson, division engineer of the U. S. Engineers.

Construction work has commenced on the three drainage pumping plants in the Sutter By-pass by Frederick W. Snook Company of San Francisco. This work is being done under the direction of the California Debris Commission at a cost of \$230,000.

DAMS

Revised plans for San Gabriel No. 1 dam were approved by the State Engineer on August 12th after intensive study and review by the department, assisted by the State's Board of Consulting Engineers.

Application was filed on July 22, 1935, for construction of a 82-foot concrete arch structure on Clear Creek in Siskiyou County. The proposed dam is estimated to cost \$9,500 and is to be used for power purposes. This application was approved on August 15, 1935.

Certificates of approval have been prepared for issuance on twelve dams located principally in the

(Continued on page 24)

\$20,000,000 Approved for Water Plan

(Continued from preceding page)

high mountain areas of Plumas, Alpine and Tuolumne counties.

Construction work on Grant Lake dam by the City of Los Angeles, Bureau of Light and Power, is progressing.

Construction of the Santa Clara Valley Water Conservation District dams is progressing rapidly. Vasona dam has been completed. Work at Coyote, Calero and Guadalupe consists principally of placing fill and that at Stevens Creek and Almaden in excavation of cut-offs, outlet conduits and stripping of foundations.

At O'Shaughnessy dam construction camps have been established and excavation of foundation for the enlarged section has been commenced.

Repair work revealed as necessary by recent maintenance inspections, because of the unusually severe winter is actively under way on many dams.

SACRAMENTO-SAN JOAQUIN WATER SUPERVISOR

Field work comprising the measurements and records of all diversions, stream flow and return flow throughout the Sacramento-San Joaquin territory and salinity records in the Delta have been continued during the past month under a reduced program.

The Sacramento River at Sacramento reached its minimum flow for the season at about 3000 second-feet early in August. Since then there has been a slight increase in flow due to increased return flow from irrigation. On August 1st, the flow of the San Joaquin River near Vernalis was 1100 second-feet as compared to 350 second-feet on the same date in 1934.

The salinity at Upper Bay and Delta stations as indicated by water samples taken on August 10, 1935, is shown in the following tabulation. This shows also a comparison with the corresponding salinity on August 10, 1934.

Station	Salinity in parts of chlorine per 100,000	
	8/10/35	8/10/34
Point Orient	1600	1720
Point Davis	1300	1660
Bulls Head	940	1380
Collinsville	180	860
Emmaton	15	500
Rio Vista	3	260
Antioch	115	740
Curtis Landing	44	620
Jersey	30	450
Rindge Pump	16	34
Middle River P. O.	7	40

WATER RIGHTS

Supervision of Appropriation of Water

Twenty-eight applications to appropriate water were received during the month of July, fifteen were denied and twenty-three approved. In the same period seven permits were revoked and the rights under six were confirmed by the issuance of license.

Particular significance attaches to two applications received for mining, domestic, and irrigation uses on San Juan Ridge in Nevada County. These applications involve appropriations from South Fork of Middle Yuba, North Fork of Poorman's Creek, Bloody Run Creek and Shady Creek. The various settlements on the Ridge have found themselves without water in recent years and the San Juan Mutual Water Users Association, which has recently been organized, seeks to develop a water supply for irrigation and domestic uses in this area, which some fifty years ago, before hydraulic mining was discontinued, was a well populated section.

Projects were inspected during July in Alpine, El Dorado and Placer counties with a view to establishing the amount of water beneficially used under permits heretofore issued.

FEDERAL COOPERATION—TOPOGRAPHIC MAPPING

Copies of Tustin and Olinda Quadrangles in Orange County are now available in final form. These sheets were mapped by the U. S. Geological Survey in cooperation with the Division of Water Resources and are published on the scale of 1:31,680.

Final sheets of Santa Felicia Canyon Quadrangle are also now available. This area was surveyed by the U. S. Geological Survey in cooperation with the county of Los Angeles and covers an area northwest of Newhall in northwestern Los Angeles County.

WATER RESOURCES

South Coastal Basin

Work on the South Coastal Basin investigation has continued along routine lines. Study is now being made of the shortage and surplus of water in the various basins.

Central Valley Project

Approval by the President of an allotment of \$20,000,000 to the Bureau of Reclamation, Interior Department, for construction of the first units of the Central Valley project in California was announced September 12 by the Division of Applications and Information.

The project will be broken down into units in order to provide an orderly construction program fitting Works Progress regulations, which require completion with allotments of useful units of projects.

Structures necessary for completion of the project within the time limit set will be selected by Dr. Elwood Mead, Reclamation Commissioner, after investigations in the field.

Dr. Mead said a dam at Friant on the San Joaquin River probably would be the principal work undertaken. The cost of this dam is estimated at \$14,000,000. From Friant Reservoir lands will be served by two canals, the Madera Canal and the Friant-Kern Canal. Like the dam, these canals make up useful and complete units of the project, as does the Contra Costa Conduit.

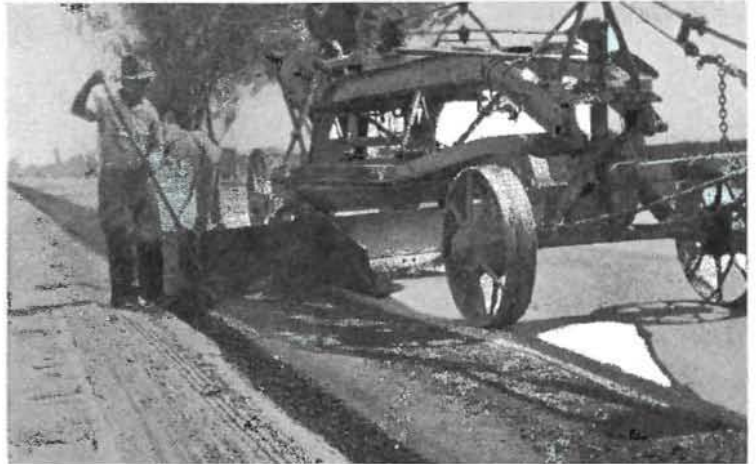
Spreader Box Attachments Developed for Oil Rock Borders on State Contract

By C. S. POPE, Construction Engineer

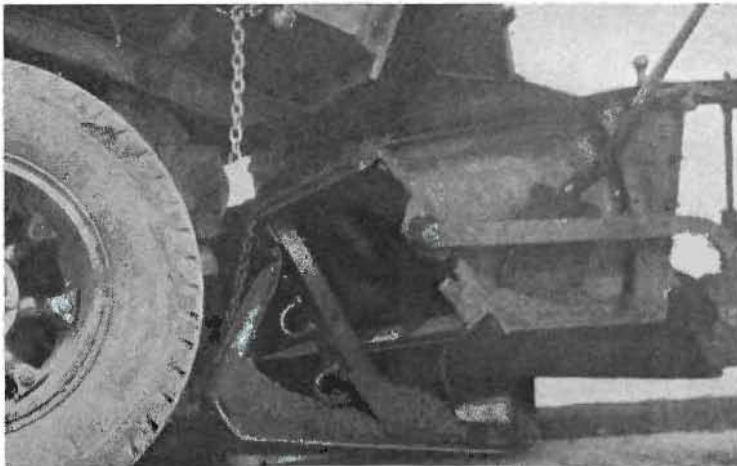
IN CONFORMITY with requests from the Division of Highways to district engineers that they render a valuable service to all districts by making known special methods of construction which they develop from time to time, the following article furnished by Construction Engineer R. S. Badger of District VI outlines methods worked out in that district for constructing oiled rock borders and reported to the Construction Department.

A contract on a portion of State Highway 4 in Fresno County which was accepted in June, 1935, provided for the construction of one mile of 20-foot asphalt concrete pavement, with 3-foot by 5-inch oil mixed crushed rock borders. The contractor used special attachments to the standard spreader box and

bottom of the box, one of which rode on the pavement and the other on the earth shoulders. These shoes had a flange which followed along the edge of the pavement as a guide to keep the spreader box in line; the



Grader and Blade Attachments



Spreader Box with Special Attachments

grader blade for placing the rock borders, which may be of interest to others engaged on similar work.

DETAIL OF ATTACHMENTS

The standard 8-foot spreader box was equipped with two steel shoes bolted to the

front ends were curved back to prevent digging into the asphalt pavement.

The flange on the outer shoe on the earth shoulders forced loose earth material which fell into the trench back into the shoulder, and also kept the crushed rock from spreading beyond the 3-foot required width of trench.

Since the 6-inch rock borders were placed in two courses the outer shoe was made in two parts, the lower part of the flange being bolted to the upper part when the base course was being placed and removed when the surface

course was placed so as not to dig into the base course.

OPERATION OF SPREADER

The 2.5-foot spreader blade which was attached to the regular adjustable blade of the spreader box successfully spread the mate-

(Continued on page 30)

August Storms Damage State Highways

(Continued from page 7)

BY G. H. NUTTING
Maintenance Superintendent

TEN MILES northeast of Weed, in Siskiyou County, on the Weed-Klamath Falls Highway, U. S. 97, is Whitney Creek, also known as Midnight or Inconstant Creek. These various names have been given this stream due to its intermittent and uncertain flow. This creek is fed from a glacier on the north slope of Mt. Shasta and only flows when the weather is warm enough to cause the melting of the glacial ice.

During this period the flow generally reaches the highway about five o'clock p.m. and stops about two o'clock a.m., depending on the temperature of the glacier.

On August 28, 1935, a warm thunder storm on the glacier started the snow and ice to melt and the resulting flow soon assumed the proportions of an avalanche.

BRIDGE DAMAGED

About one thousand feet of the Southern Pacific Railroad track, which crosses the stream about one and one-half miles above the highway, were washed out, and the torrent of water carrying mud, rocks and trees poured down on the highway, cutting under the abutments at the south end of the Whitney Creek bridge and would undoubtedly have washed out the entire bridge except that the channel became blocked about one-half mile upstream and a new channel was cut that missed the bridge by four hundred feet.

A portion of the water poured over the road covering it with rocks and mud to a depth of about four feet. The balance of the stream flowed down the gutter line on the south side of the highway, cutting the ditch to three times its normal depth and washing out the side of the road. This stream followed the highway for eight-tenths of a mile before crossing it and at this point piled up a mass of debris three feet deep and 400 feet long.

Equipment was rushed to the scene the same night and in spite of the continued flow the bridge was repaired, the stream returned to its normal channel and the road again opened to traffic on August 30th.

BY E. Q. SULLIVAN
District Engineer, District VIII

THE LOCATIONS of the heaviest cloudbursts in this district may be outlined as follows:

Between Helendale and Barstow in San Bernardino County rains fell to the southeast of the highway bringing large quantities of sand and gravel with the flow of water, and depositing this debris in the highway dips. The highway was blocked for a period of two or three hours.

On the Death Valley Road, State Highway No. 127, about thirty miles north of Baker, a storm of great intensity in the desert mountains brought large quantities of boulders and mud down onto the highway over a distance of about one and one-quarter miles. The mud was so saturated with water that it was impossible to work any maintenance equipment over the area for about three days. After the water had drained out of the material, tractors and graders were employed to open up this section to traffic. The road was closed for a total period of four days.

DESERT ROUTE FLOODED.

Route 31 near Valley Wells and Route 58 fifteen miles east of Amboy were hit by a storm of similar intensity. The water flowing down upon the highway taxed the structures to capacity and overflowed the highway in many places. No damage on these sections was done except that a few of the stop dykes built for the concentration of water to the structures were washed out.

Between Redlands and Beaumont on Route 26, many of the structures were over-taxed by heavy storm centered in the Yucaipa district. The water in a number of places flowed over the highway and down the parallel drainage ditches, doing considerable damage to the roadsides and shoulders. On this area it was necessary to employ a power shovel and six dump trucks in back-filling shoulders and material scoured from the roadside ditches. Traffic was tied up for an hour or two at one of the locations where the water and sand crossed the highway.

Route 187 (earth road) leading from Route 26 into the Morongo Valley, was scoured badly for a distance of twelve miles.

(Continued on page 27)



DEBRIS FROM SHASTA GLACIER flood waters covered State Highway 72 in storm of August 28 to a depth of four feet as shown in pictures on this page and page 29.



HIGHWAYS DAMAGED BY STORMS

(Continued from preceding page)

In the vicinity of Palm Springs, the secondary highway to Indio by the way of Palm Springs was inundated two or three times by storms occurring in Palm Canyon.

Because of vast burnt off areas in Palm Canyon storms in this area always bring

down great quantities of ashes and mud which are deposited on the highway for a depth of two or three feet over a distance of about three hundred feet. Each time a deposit of this kind is made on the highway, the highway is blocked for a period of three or four hours until equipment can clear the travel way.

Traffic Count Shows 15.3% Gain Throughout State over July 1934

By T. H. DENNIS, Maintenance Engineer

THE semiannual count of traffic on the State highways was taken on Sunday and Monday, July 14 and 15, 1935, and covered the sixteen-hour period from 6 a.m. to 10 p.m. each day.

The field sheets segregate traffic by hourly periods under the following vehicle classifications: California automobiles, foreign automobiles, light trucks, heavy trucks, trailers, buses, and horse drawn. In the complete tabulations of the count are recorded the totals of all these types of vehicles on each day of the census.

The total vehicles observed on both days of the count are 15.3 per cent in excess of the number recorded in 1934. A considerable portion of this gain must be attributed to the exceptional traffic attracted to the San Diego Exposition.

68.05 PER CENT GAIN

For instance, a seven-day count on route 2 at the Del Mar overhead railroad crossing north of San Diego shows an increase of 68.05 per cent in total vehicles over last year.

Last year a comparatively slight gain in travel was recorded for the state as a whole. This year the gain is quite general, as will be noted in the following summary:

Per Cent Gain or Loss for 1935 Count as Compared With 1934

	Sunday	Monday
All Routes.....	+16.2	+14.0
Main North and South Routes.....	+14.9	+12.8
Interstate Connections.....	+10.0	+12.8
Laterals Between Inland and Coast.....	+13.6	+ 9.5
Recreational Routes.....	+27.3	+27.1

The gain or loss of traffic volume for State Highway Routes 1 to 80, inclusive, which constitute the basis of the above summary, is shown in the following tabulation:

Route	Termini	1935			
		Per cent gain or loss Sunday		Monday	
		Gain	Loss	Gain	Loss
1. Sausalito-Oregon Line.....		21.99		12.07	
2. Mexico Line-San Francisco.....		15.38		15.65	
3. Sacramento-Oregon Line.....		15.26		8.11	
4. Los Angeles-Sacramento.....		12.26		9.92	
5. Santa Cruz-Jc. Rt. 65 near Mokelumne Hill.....		21.62		12.75	
6. Napa-Sacramento via Winters.....		24.21		16.15	
7. Benicia-Tehama Jc.....		15.68		7.02	
8. Ignacio-Cordelia via Napa.....		27.29		5.31	
9. Jc. Rt. 2 near Montalvo-San Bernardino.....			6.28	1.57	
10. Rt. 2 at San Lucas-Sequoia National Park.....		32.46		34.26	
11. Jc. Rt. 75 near Antioch-Nev. Line via Placerville.....		11.93		14.07	
12. San Diego-El Centro.....		14.94		20.81	
13. Jc. Rt. 4 at Salida-Jc. Rt. 23 at Senera Jc.....		33.59		26.32	
14. Albany-Martinez.....		22.13		5.92	
15. Rt. 1 near Calpella-Rt. 37 near Cisco.....		33.20		13.61	
16. Hopland-Lakeport.....		11.03		11.23	

Route	Termini	1935			
		Per cent gain or loss Sunday		Monday	
		Gain	Loss	Gain	Loss
17. Jc. Rt. 3 at Roseville-Jc. Rt. 15, Nevada City.....		20.46		13.56	
18. Jc. Rt. 4 at Merced-Jc. Rt. 49 near Sequoia.....		14.13		13.23	
19. Jc. Rt. 2 at Fullerton-Jc. Rt. 26 at Beaumont.....		9.17		7.64	
20. Jc. Rt. 1 near Arcata-Jc. Rt. 83 at Park Bdy.....		16.34			1.13
21. Jc. Rt. 3 near Richvale-Jc. Rt. 29 near Chilcoot via Quincy.....		2.32		16.04	
22. Jc. Rt. 56, Castrovilla-Jc. Rt. 29 via Hollister.....		30.04		26.40	
23. Saugus-Rt. 11, Alpine Jc.....		6.73		9.78	
24. Jc. Rt. 4 near Lodi-Nev. State Line.....		22.07			2.61
25. Jc. Rt. 37 at Colfax-Jc. Rt. 83 near Battley.....		11.40			0.22
26. Los Angeles-Mexico via San Bernardino.....		9.72		14.25	
27. El Centro-Yuma.....		8.52		12.91	
28. Redding-Nevada Line via Alturas.....		2.65			2.11
29. Peanut-Nevada Line near Purdy's.....		5.23			2.81
31. San Bernardino-Nevada State Line.....			1.24	9.72	
32. Jc. Rt. 56, Watsonville-Rt. 4 near Califa.....		24.51		20.33	
33. Rt. 56 near Cambria-Rt. 4 near Famoso.....		28.56		40.40	
34. Jc. Rt. 4 at Galt-Rt. 23 at Pickett's Jc.....		39.21		28.18	
35. Jc. Rt. 1 at Alton-Jc. Rt. 20 at Douglas City.....			1.34	31.28	
37. Auburn-Truckee.....		10.75		9.54	
38. Jc. Rt. 11 at Mays-Nevada Line via Truckee River.....		24.65			2.89
39. Jc. Rt. 33 at Tahoe City-Nevada State Line.....		33.08		5.76	
40. Jc. Rt. 13 near Montezuma-Jc. Rt. 76 at Benton.....		35.93		26.45	
41. Jc. Rt. 5 near Tracy-Kings River Canyon via Fresno.....		30.50		22.86	
42. Redwood Park-Los Gatos.....		27.49		13.08	
43. Jc. Rt. 60 at Newport Beach-Jc. Rt. 31 near Victorville.....		39.04		30.89	
44. Boulder Creek-Redwood Park.....		31.10		20.83	
45. Jc. Rt. 7, Willows-Jc. Rt. 3 near Biggs.....		19.55		20.21	
46. Rt. 1 near Klamath-Rt. 3 near Gray.....		2.54		2.69	
47. Jc. Rt. 7, Orland-Jc. Rt. 29 near Morgan.....		32.69		18.52	
48. Rt. 1 near McDonalds-Rt. 56 near Albion.....		16.84		10.87	
49. Napa to Jc. Rt. 15 near Sweet Hollow Summit.....		30.08			1.61
50. Sacramento-Jc. Rt. 15.....		26.67		34.33	
51. Jc. Rt. 8 at Schellville-Sebastopol.....		15.18		10.08	
52. Alto-Tiburon.....		13.97		21.20	
53. Jc. Rt. 7 at Fairfield-Jc. Rt. 4 at Lodi via Rio Vista.....		17.21		9.60	
54. Jc. Rt. 11 at Perkins-Jc. Rt. 65 at Central House.....		22.38		7.47	
55. Jc. Rt. 5 near Glenwood-San Francisco.....		4.44		8.03	
56. Jc. Rt. 2 at Las Cruces-Rt. 1 near Fernbridge.....		14.26		6.12	
57. Rt. 2 near Santa Maria-Rt. 23 near Freeman via Bakersfield.....		17.98		17.28	
58. Rt. 2 near Santa Margarita-Ariz. Line near Toppek via Mojave and Barstow.....		7.22			0.82
59. Jc. Rt. 4 at Baileys-Jc. Rt. 43 at Lake Arrowhead.....		12.17		19.31	
60. Jc. Rt. 2 at Serra-Jc. Rt. 2 at El Rio.....		33.41		45.66	
61. Jc. Rt. 4 S. of Glendale-Jc. Rt. 59 near Phelan.....		5.54		6.50	
63. Big Pine-Nevada State Line.....			3.47		5.63
64. Jc. Rt. 2 at San Juan Capistrano-Blythe.....		48.11		39.01	
65. Jc. Rt. 18 near Mariposa-Auburn.....		13.13		10.22	
66. Jc. Rt. 5 near Mossdale-Jc. Rt. 13 near Oakdale.....		29.92		26.56	
67. Paiare River-Rt. 2 near San Benito River Bridge.....		139.12		197.70	
68. San Jose-San Francisco.....		13.72		12.07	
69. Jc. Rt. 5 at Warm Springs-Jc. Rt. 1, San Rafael.....		38.73		15.58	
70. Ukiah-Talmage.....			1.23	10.46	
71. Crescent City-Oregon Line.....		20.62		27.54	
72. Weed-Oregon Line.....		39.89		40.47	
73. Rt. 29 near Johnstown-Oregon Line.....		25.35		18.09	
74. Carquinez Bridge-Napa Wye.....		19.71		10.39	
75. Oakland-Jc. Rt. 65 at Altaville.....		9.04		7.50	
76. Jc. Rt. 125 at Shaw Ave.—Nevada State Line near Benton.....		6.63		13.38	
77. San Diego-Pomona.....		13.64		28.39	
78. Jc. Rt. 12 near Descanso-Jc. Rt. 19 near March Field.....		24.63		16.34	
79. Jc. Rt. 2, Ventura-Jc. Rt. 4 at Castaic.....		4.64		14.79	
80. Jc. Rt. 51, Rincon Creek-Rt. 2 near Zaca.....		19.54		12.62	

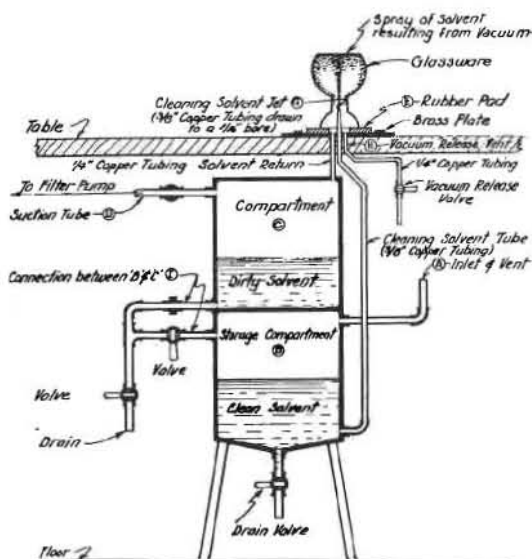
Engineer Develops Method for Washing Oil Stained Glass

A quick and easy method of washing oil or asphalt stained glassware has been developed by Junior Physical Testing Engineer C. E. Rhodes of the Materials and Research Department, Division of Highways.

The apparatus consists of a tank 20" high by 10" diameter, divided into equal size compartments. Cleaning solvent is introduced into compartment B through A. Stained glassware is placed open end down on a rubber pad E through which tubes F, G, and H extend. The air in tank C is exhausted by suction through D. This causes a vacuum in the glassware through vent F, forcing the solvent in tank B through tube G with sufficient force to strike the top of the vessel resting on rubber pad E.

The solvent returns to C through F. When the glassware has been washed a valve connected to H is opened breaking the vacuum so that the glassware can be easily removed.

Tanks B and C are connected through I. This cleaning apparatus is so constructed that the solvent accumulated in tank C may



be returned to tank B for further use or can be otherwise disposed of. Tank B is equipped with a valve in the bottom for cleaning purposes.

The apparatus is particularly efficient for cleaning viscosity flasks, distillation flasks, and graduates up to 1000 cc capacity. Vacuum or water filtering pumps may be used to create the vacuum in C.



STATE HIGHWAY 72 BURIED under four feet of mud and boulders by flood waters from Mt. Shasta Glacier and Whitney Creek was cleared and opened to traffic in two days following the storm of August 28. The debris covered the road for a distance of 400 yards.

Oil Rock Borders Placed by Spreader Box Attachments

(Continued from page 25)

rial in the 3-foot trench. The spreader box chains were fastened high on the trucks in order to raise the front ends of the shoes about 1½ inches, thus causing the weight of box to be partially carried by the truck and prevented gouging of the earth shoulders.

One-quarter-inch steel plates were fastened inside the spreader box on each end, forming two false sloping sides or inclined planes, and leaving a 2.5-foot opening in the middle of the box. As the material was dumped into the spreader box, these plates forced it through the opening and spread it the full 3-foot width of border. It was found, however, that a 2-foot opening would have been wide enough to fill the 3-foot trench.

ROLLED BY TRUCK

As specified in the special provisions, the rock borders were laid in two courses. The base course was rolled with a loaded dump truck and it was found that this compacted the mixture more satisfactorily than a roller because the truck tire rolled all portions of the trench, pushing sideways as well as downward, and a much better bond was obtained between the pavement edge and the border.

The grader was equipped with two winged flanges set vertically and perpendicular to the plane of the blade surface. One wing was attached to the end of the blade and the other 3 feet from it. The action of the blade and wings was similar to that obtained by the screens of a mechanical finisher, as the compartment made by the blade and wings was kept full of material at all times and fed or cut as the surface required.

GIVES SATISFACTORY RESULTS

The rock border was left ¼ inch higher than the edge of pavement; hence when the grader blade passed over the border some material fell onto the pavement. A small wooden drag was attached behind the blade on a slight angle with the outside and even with the edge of the pavement, and this drag pushed the scattered material back onto the border. After the material was allowed to cool and set for some time, it was given a final rolling, the above methods resulting in a very good appearing job.

F. W. Howard was resident engineer in charge of this contract.

California Second in Gas Consumption in 1934; Third in Revenue

GASOLINE-TAX income continued to increase in 1934 following a rally in 1933, after the year 1932 had shown the first decrease in the history of the tax. According to reports collected from State authorities by the U. S. Bureau of Public Roads, the total of 1934 receipts, with refunds deducted, was \$565,027,000—an increase of about 9 per cent compared with 1933.

Receipts for 1933 had shown an increase of about 1 per cent compared with 1932, while receipts for 1932 had shown a decrease of 4.1 per cent compared with the previous year.

Total 1934 consumption was 15,454,481,000 gallons, a new peak.

The five leading states in gallonage taxed were: New York, California, Pennsylvania, Ohio and Illinois.

CALIFORNIA THIRD IN REVENUE

New York collected the largest tax revenue, amounting to \$43,927,000; Ohio, \$37,618,000; California, \$35,960,000; Pennsylvania, \$33,409,000; Texas, \$31,640,000; Illinois, \$29,126,000.

The weighted average State tax rate for 1934 was 3.66 cents per gallon.

Florida and Tennessee had the highest rates, each collecting \$.07 per gallon. Arkansas was next with \$.06½ followed by Alabama, Idaho, Mississippi, North Dakota and South Carolina with \$.06 per gallon.

California with a three cent tax consumed 1,198,650,000 gallons, second only to New York with a consumption of 1,464,242,000.

An increase in consumption was shown by all states and a decrease by the District of Columbia.

AUSTRALIA BAKES SOIL IN ITS EXPERIMENTAL ROAD BUILDING

In Queensland, Australia, there are many areas of heavy black soil. The roads, unless surfaced, are almost impassable in wet weather. The Main Roads Board has built an experimental section of two miles using a machine which bakes the soil into hard clinker-like lumps up to three or four inches in diameter. The soil is baked to depths varying from two to eight inches. The machine covers a strip six feet wide and moves forward at an average speed of 22 feet per hour. On this road a surface 12 feet wide was heated. After baking, the clinker was broken and spread evenly over the road, forming a firm surface.

Highway Bids and Awards for August

CALAVERAS and ALPINE COUNTIES—Between Dorrington and Hermit Valley (X Cal. Alp-24-F.G.A B), about 24.6 miles in length. Liquid asphalt to be furnished and applied. District X, Route 24, Sec. F G, A B. C. F. Fredrickson & Sons, Lower Lake, \$8,120. Contract awarded to Hayward Building Material Co., Hayward, \$7,559.

EL DORADO COUNTY—About 1 mile length untreated crushed gravel or stone base and road-mix surfacing to be placed at Oglesby Canyon. District III, Route II, Section F. A. Teichert & Son, Inc., Sacramento. Contract awarded to M. J. B. Const. Co., Stockton, \$13,915.25.

EL DORADO COUNTY—Between Kyburz and Strawberry, about 7.9 miles. Install C. M. P. culverts, perforated metal pipe underdrains and spillway assemblies. District III, Route 11, Section H. N. M. Ball Sons, Berkeley, \$27,864; George Pollock Co., Sacramento, \$30,005; Hemstreet & Bell, Marysville, \$25,298; Albert H. Siemer, John J. Ongaro, San Anselmo, \$27,723; L. C. Seidel, Oakland, \$38,350; M. J. B. Construction Co., Stockton, \$20,306. Contract awarded to Harms Bros., Sacramento, \$18,526.40.

EL DORADO and YOLO COUNTIES—Between Auburn Junction (mi. 7.89) and Cool and between 4 miles N. of Sol-Yolo County line and irrigation canal, 28 miles in length to be treated with liquid asphalt. District III, Routes 93, 99, Sections A, B; A. A. Teichert & Son, Inc., Sacramento, \$7,032; Hayward Bldg. Matl. Co., Hayward, \$6,474. Contract awarded to Edw. F. Hilliard, Sacramento, \$4,325.

INYO COUNTY—Big Pine to east end of Cedar Flat, about 13.5 miles road oil to be applied. District IX, Route 63, Section A-B. Square Oil Co., Inc., Los Angeles, \$4,858; Oilfields Trucking Co., Bakersfield, \$6,247. Contract awarded to Paulsen & March, Inc., \$4,459.85.

INYO COUNTY—Between 0.5 miles west Lone Pine and Darwin, District IX, Route 127, Sections B, C, D, E, F. Gilmore Oil Company, Los Angeles, \$5,680; Hayward Bld. Matl. Co., Hayward, \$7,524; Square Oil Co., Los Angeles, \$5,040. Contract awarded to Paulsen & March, Inc., \$4,806.

KERN COUNTY—Between one mile south of Delano and Delano, about 1 mile to be graded and paved with either A. C. or P. C. C. and reinforced concrete underpass abutments to be constructed. District VI, Route 4, Section F, Dln. Hanrahan Wilcox Corporation, San Francisco, \$109,752; Peninsula Paving Company, San Francisco, \$119,771; Fredrickson & Watson Construction Co.-Fredrickson Bros., Oakland, \$109,749; Basich Brothers, Torrance, \$105,059. Contract awarded to Griffith Company, Los Angeles, \$94,994.60.

LAKE COUNTY—Between Middletown and Junction with Lower Lake Road, (20.1 miles) to be treated with liquid asphalt. District I, Route 89, Section B & C. E. A. Forde, San Anselmo, \$2,581. Contract awarded to Basalt Rock Co., Inc., Napa, \$2,537.50.

LOS ANGELES COUNTY—Sunset Boulevard between La Veta Terrace and Santa Monica Boulevard, about 1.4 miles to be paved with asphalt concrete. District VII, Route 2, Section L. A. Geo. R. Curtis Pav. Co., Los Angeles, \$4,343; Southwest Pav. Co., Roscoe, \$52,632. Contract awarded to Griffith Company, Los Angeles, \$39,913.

LOS ANGELES COUNTY—Firestone Boulevard, between Cerritos Avenue and Mercantile Place and Ramona Boulevard between Aliso and Fickett Streets, to be treated with Liquid Asphalt by road mix method and seal coat applied. District VII, Routes 174, 26, Sections L.A. B. Basich Bros., Torrance, \$10,120; A. S. Vinnell Co., Los Angeles, \$10,298; Paul R. Hughes, Long Beach, \$10,350; Zimmer Construction Co., Los Angeles, \$10,455. Contract awarded to Oswald Bros., Los Angeles, \$9,940.

MARIN COUNTY—Furnish and apply seal coat between Manzanita and northerly boundary, about 48.9 miles. District IV, Route 56, Sections A, B, C, D. Lee J. Immel, Berkeley, \$16,780; E. A. Forde, San

Anselmo, \$14,800; Hayward Building Mat'l Co., Hayward \$14,025. Contract awarded to Pacific Truck Service, Inc., San Jose, \$12,559.50.

MENDOCINO COUNTY—Between Gualala and 8 miles north of Fort Bragg (87.5 miles) to be treated with liquid asphalt. District I, Route 56, Sections A, B, C, D, E, & F. Hayward Building Mat. Co., Hayward, \$14,246; Pacific Truck Service, Inc., San Jose, \$18,012; Chas. Kuppinger, Lakeport, \$12,995. Contract awarded to Albert Helwig, Sebastapol, \$12,405.70.

MODOC COUNTY—In Modoc County, between Rush Creek and Adin, about 5.2 miles in length, crushed gravel to be furnished. District II, Route 28, Section A. Tiffany Construction Co., San Jose, \$12,000; Eeman & Jones, Stockton, \$12,840; Pacific Truck Service, Inc., San Jose, \$14,880. Contract awarded to Hemstreet & Bell, Marysville, \$10,200.

NEVADA and PLACER COUNTIES—Between 1 mile west of Soda Springs and Donner Summit, about 3.7 miles perforated metal pipe underdrains and corrugated metal pipe culverts to be installed. District III, Route 37, Sections B, C, G. Hemstreet & Bell, Marysville, \$43,062; N. M. Ball Sons, Berkeley, \$52,710; George Pollock Co., Sacramento, \$38,995; Albert H. Siemer, John J. Ongaro, San Anselmo, \$39,144. Contract awarded to Harms Bros., Sacramento, \$35,981.10.

RIVERSIDE COUNTY—Between Valle Vista and about 50.1 miles, seal coat to be applied. District VIII, Route 64, Sections L, M, N, P. E. L. Yeager, San Bernardino, \$27,840; A. S. Vinnell Co., Los Angeles, \$31,125. Contract awarded to Square Oil Co., Los Angeles, \$21,644.

RIVERSIDE COUNTY—Between Corona and southerly boundary and between Riverside and Elsinore, about 66.7 miles. Apply seal coat to existing shoulders. District VIII, Routes 77, 78, 19, Sections A, B, C, D, C D, E. R. S. Hazard Constructing Co., San Diego, \$18,419; E. L. Yeager, San Bernardino, \$18,870; A. S. Vinnell Co., Los Angeles, \$19,638; Martin Bros. Trucking Co., Long Beach, \$25,171. Contract awarded to C. O. Sparks, Los Angeles, \$16,135.

SAN BENITO COUNTY—Between San Benito and Willow Creek and between Route 119 and Pinnacles National Monument, about 13.7 miles to be treated with liquid asphalt. District V, Routes 119, 120, Section C. A. Gilmore Oil Co., Los Angeles, \$4,169; Pacific Truck Service, Inc., San Jose, \$4,723; Oilfields Trucking Co., Bakersfield, \$5,152. Contract awarded to L. A. Brisco, Arroyo Grande, \$3,696.

SAN BENITO, MONTEREY, SAN LUIS OBISPO and SANTA BARBARA COUNTIES—Apply traffic stripe to pavement in District V, for a distance of 550 miles. District V, Routes 2, 22, 33, 56, 67, 80, 117, 118, 119, 148 and 149, various sections. S. A. Cummings, San Diego, \$4,020; Edwin Anderson, San Francisco, \$4,200. Contract awarded to Al. W. Simmonds, Sacramento, \$3,604.

SAN BERNARDINO COUNTY—Between Barstow and Mountain Pass, about 30.8 miles in length. Seal coat to be applied. District VIII, Route 31, Sections G, H, J, K, M, N. Ernest L. Yeager, Los Angeles, \$15,900; Match Bros., Elsinore, \$15,060; Geo. Herz & Co., San Bernardino, \$14,812; R. E. Hazard, San Diego, \$16,882; A. S. Vinnell Co., Los Angeles, \$16,800. Contract awarded to C. O. Sparks, Los Angeles, \$14,025.

SAN BERNARDINO COUNTY—At Mountain Pass Maintenance Station Site. A water supply well to be drilled. District VIII, Route 31, Section N. W. D. Anderson, San Bernardino, \$1,975; Lyon Bros., Los Angeles, \$1,350; D. A. Beck & Sons, Inc., Alta Loma, \$1,095. Contract awarded to Jesse W. Burkhart, Adelanta, \$1,007.25.

SAN BERNARDINO COUNTY—Between Alabama Street and State Street, about 1.9 miles to be graded and paved with P. C. C. or A. C. District VIII, Route 26, Section A. Rid. Basich Bros., Torrance, \$76,763; Match Bros., Elsinore, \$76,815; B. G. Carroll, San Diego, \$77,246; C. O. Sparks, Los Angeles, \$79,000. Contract awarded to Geo. Herz Co., San Bernardino, \$74,578.40.

(Continued on page 32)

Highway Bids and Awards for Month of August

(Continued from preceding page)

SAN BERNARDINO COUNTY—Between Santa Ana River and M Street in Colton, about one (1.0) mile in length to be graded and a road-mix surface treatment applied, and reinforced concrete abutments for an undergrade railroad crossing, to be constructed. District VIII, Route 43, Sections F & Col. Geo. Herz & Co., San Bernardino, \$33,152; Match Bros., Elsinore, \$38,630; Griffith Co., Los Angeles, \$41,178; R. R. Bishop, Long Beach, \$43,309; Basich Bros., Torrance, \$33,069; Louis C. Seidel, Oakland, \$35,462; Mundo Eng. Co., Los Angeles, \$33,184; Oscar Oberg, Los Angeles, \$34,841; Geo. R. Curtis Paving Co., Los Angeles, \$42,228. Contract awarded to E. G. Carroll, San Diego, \$29,877.

SAN BERNARDINO COUNTY I Street between west city limits and east city limits of Colton, about 1.3 miles to be graded and paved with A. C. and a reinforced concrete bridge on steel piles to be constructed. District VIII, Route 26, Section Col. Geo. R. Curtis Pav. Co., Los Angeles, \$93,726; Basich Bros., Torrance, \$94,072; Mundo Engineering Co., Los Angeles, \$98,763; Oswald Bros., Los Angeles, \$96,650. Contract awarded to Griffith Co., Los Angeles, \$90,420.60.

SAN DIEGO COUNTY—Between Jamul and White Star, 46 miles (more or less) treating with liquid asphalt. District XI, Route 200, Sections B, C, D & E. Square Oil Co., Los Angeles, \$15,750; Gilmore Oil Co., Los Angeles, \$13,793; R. E. Hazard Const. Co., San Diego, \$14,287; Morgan Bros., Huntington Park, \$13,365. Contract awarded to Paulsen & March, Inc., Los Angeles, \$12,318.75.

SAN DIEGO COUNTY—Between Julian and a point 25 miles easterly. Liquid asphalt to be applied. District XI, Route 198, Sections E, F and G. Gilmore Oil Co., Los Angeles, \$6,612; Morgan Bros., Huntington Park, \$6,850; Paulsen & March, Inc., Los Angeles, \$5,549. Contract awarded to Square Oil Co., Los Angeles, \$5,978.

SAN MATEO COUNTY—Between Edgemar and Thornton, about 3.6 miles to be graded, surfaced with crusher run base and bituminous surface treatment applied. District IV, Route 58, Section E. Peninsula Paving Company, San Francisco, \$107,448; Bayshore Construction Co., Inc., San Francisco, \$101,917; Granfield, Farrar & Carlin, San Francisco, \$111,479; Fredrickson & Watson Construction Co., Fredrickson Bros., Oakland, \$116,793; Healy Tibbitts Construction Co., San Francisco, \$121,721; A. Teichert & Son, Inc., Sacramento, \$122,337. Contract awarded to Union Paving Co., San Francisco, \$97,437.50.

SANTA CLARA COUNTY—Underground crossing under S. P. R. R. about 1 1/2 miles south of Agnew. Two concrete abutments with W.w.'s and about .29 mile of roadway to be graded and paved with P. C. C. District IV, Route 68, Section B. Fredrickson & Watson Construction Co., Fredrickson Bros., Oakland, \$123,240; J. F. Knapp, Oakland, \$116,164; Eaton-Smith, San Francisco, \$125,480; Peninsula Paving Co., San Francisco, \$137,024; Hanrahan-Wilcox Corp., San Francisco, \$131,623; Healy-Tibbitts Const. Co., San Francisco, \$124,458. Contract awarded to Earl W. Heple, San Jose, \$103,850.20.

SANTA CLARA-SANTA CRUZ COUNTIES—Slide removal between Saratoga Gap and Black road, about 1.3 miles. District IV, Route 55, Section A. Bayshore Constr. Co., San Francisco, \$5,920; Garcia Constr. Co., Irvington, \$8,800; W. E. Karstedt, San Jose, \$6,560; Earl W. Heple, San Jose, \$5,280; Cnerin Bros., San Francisco, \$9,440; R. A. Parish, San Francisco, \$6,240; Jas. L. Conner, Monterey, \$8,320; Harrison & Harrison, Niles, \$5,760; Granfield, Farrar & Carlin, San Francisco, \$6,720. Contract awarded to Forsythe-Warden Co., San Leandro, \$4,480.

SHASTA COUNTY—Between Court Street and California Street, in Redding, about 0.1 miles to be graded and surfaced. District II, Route 20, Section Rdc. T. M. Morgan Paving Co., Los Angeles, \$10,637; Tiffany Construction Co., San Jose, \$11,683. Contract awarded to Hemstreet & Bell, Marysville, \$10,469.

In Memoriam

F. S. CHRISTENSEN, powderman, attached to District II, Division of Highways, came to his death in a premature explosion at Convict Camp 28 where he was employed on the construction of a unit of the Feather River Highway.

Mr. Christensen was born on July 21, 1889, in Denmark and came to America at an early age. During the last fifteen years he has seen service on various construction projects in California in responsible charge of work for several of the larger contracting companies. During the years 1921 and 1922 he was employed by the state as a foreman in a prison camp in District I. He again entered state service in April, 1930, on the Feather River Highway as powderman, where he was employed until his death.

Mr. Christensen leaves a widow and three minor children now living in Oakland, California.

Mr. Christensen was a capable and industrious employee of the state. He was respected for his ability and was highly esteemed by his fellow employees.

RAYMOND FRANKLIN BULAND, assistant highway engineer of District II met his death in an accident while on duty on August 23, 1935, at Tule Lake, where he had gone from his home in Redding as resident engineer on a grading contract between Stronghold and Hatfield.

Mr. Buland was born October 14, 1889 at Lynn Grove, Iowa, and was educated at the Iowa State University at Ames, Iowa. He began his career as an Assistant Estimator for the Southwestern Engineering Company at San Antonio, Texas in 1913, and with the exception of a year in the service of his country during the World War, kept to the engineering profession. Prior to entering the service of the State his work was confined to the middle west, from Texas to Wyoming, with two years in Brazil, South America.

He was certified to the position of junior service engineer with the Division of Highways, District II, on May 7, 1930, and in two years advanced to the position of resident engineer.

Besides the widow, Mrs. Martha Elizabeth Buland, he leaves a son, Robert Noel, 9 years of age, and a daughter, Nancy Ann, 2 years of age; a brother, W. L. Buland, and his mother, both of Los Angeles.

Mr. Buland had the friendship and respect of all his associates, and for his friends and his work he had a high ideal of duty and responsibility. His family loses a good husband and father; the State, a conscientious and capable employee and his friends, a friend.

The sympathy of our entire organization is extended to the bereaved family.

STATE OF CALIFORNIA
Department of Public Works

Headquarters: Public Works Building, Eleventh and P Sts., Sacramento

FRANK F. MERRIAM.....Governor
 EARL LEE KELLY.....Director
 JUSTUS F. CRAEMER.....Assistant Director
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 C. H. KROMER, Principal Structural Engineer
 CARLETON PIERSON, Supervising Specification Writer
 J. W. DUTTON, Principal Engineer, General Construction
 W. H. ROCKINGHAM, Principal Mechanical and Electrical Engineer

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DIVISION OF PORTS

Port of Eureka—William Clark, Sr., Surveyor

MAP SHOWING STATE HIGHWAY SYSTEM

LEGEND

Primary Roads 
 Secondary Roads 



SAN FRANCISCO AND VICINITY



LOS ANGELES AND VICINITY



See Detail Map

See Detail Map