

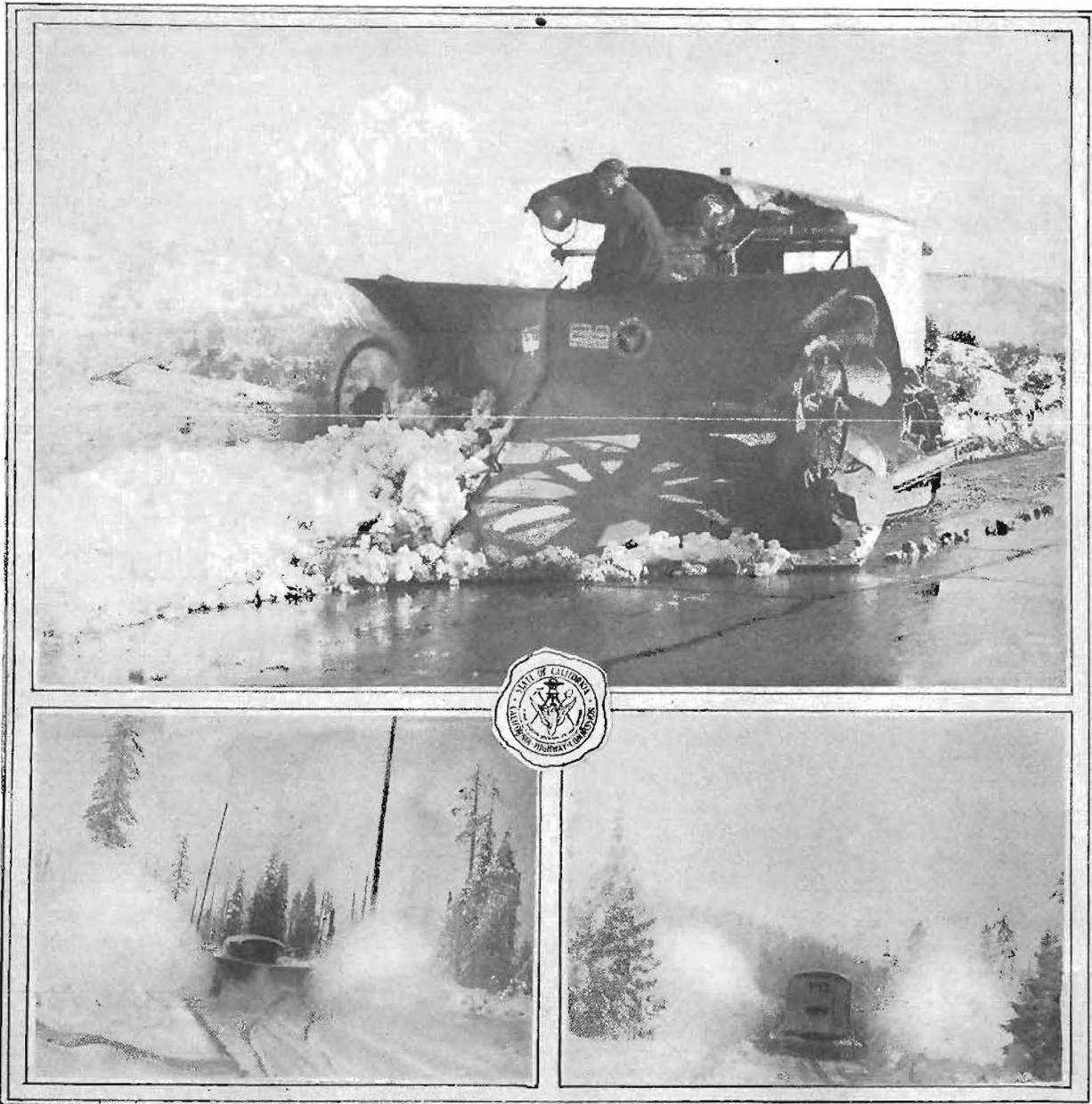
CALIFORNIA HIGHWAYS

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

Vol. 4

FEBRUARY, 1927

No. 2



Keeping Pacific highway open. Rotary plow in action near Mount Shasta City, Siskiyou County. Equipment in charge of maintenance crew of Division II. See article on page 5.

In this Issue: A DISCUSSION OF COST ACCOUNTING ON DAY LABOR JOBS—GRAPHIC CHARTS AND THEIR USE IN BRIDGE DESIGNING.

CALIFORNIA HIGHWAYS

This Bulletin is published by the California Highway Commission for the information of its employees and the public. Editors of newspapers and others interested are welcome to use, without restriction, any of the matter herein contained. Cuts will be gladly loaned upon request.

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

Vol. 4. FEBRUARY, 1927. No. 2

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COMMISSION APPOINTS NEW ATTORNEY AND SECRETARY

THE commission, at its meeting in Sacramento on February 23d, announced the appointment of Harry Encell of Oakland, as attorney, to succeed Paul F. Fratessa of San Francisco, resigned. Mr. Encell was formerly in the state service as attorney for the Board of Medical Examiners and is a well known member of the bar.

E. Forrest Mitchell of Belvedere was chosen secretary to succeed W. F. Mixon, resigned. The new secretary has long been active in public affairs and is well known throughout the state. Mr. Mixon, on March 1st. will assume new duties as Secretary of the Yolo County Board of Trade with headquarters in Woodland.

THE AMERICAN ENGINEER

WE MARVEL at the remarkable accomplishments of the engineering profession—the great railway and steamship lines of this country—automobiles and successful commercial airplanes—our massive hydro-electric and other power plants—gigantic irrigation systems—ponderous steel-making and scores of other industrial plants because we can see them—great, massive, throbbing, pulsating things before us.

They are wonderful achievements. That is instantly apparent, but there is a phase of the work of the engineering profession with which the average layman is perhaps not so familiar and to which may be directly traced the present day prosperity of American industry.

It is the constant struggle of American engineers for greater efficiency. The history of the profession fairly bristles with successful accomplishments in this direction.

Present day industries are tremendously interested in any improvement or step which reduces the cost of production or operation and that is where our engineers have made truly remarkable strides.

You enjoy an automobile on a fine paved highway or ride in comfort in a palatial train or steamship or in an airplane and you have countless other comforts at a reasonable cost because engineers have made it possible. We can't measure our indebtedness to them.—Charles Schwab.

COOPERATION.

An item in the King City *Herald* tells of the cooperation extended King City by a maintenance crew of Division V. The main street through the municipality was repaired by state forces. Says the *Herald*:

The work done by the highway crew is for the town and the Highway Commission will charge for the labor and materials. The town is able to get it done in this manner much more economically than would be the case if it had to assemble its own materials and crew.

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

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

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



Rebuilding State Highways



(An editorial from the Santa Barbara Press.)

“WHY DIDN'T they build it right in the first place and save all this money?” asked a man relative to the hundreds of thousands of dollars being spent upon the state highway east and west of Santa Barbara.

The question is easily answered.* When these roads were first built there was no heavy demand upon them by the traffic—and who could have foreseen ten or fifteen years ago that the automobile would have increased to the extent that it has today?

When the state highways of California were originally built it was thought that if they were wide enough for a car to find comfortable traveling in one direction it would be sufficient. They could pass each other at slower speeds and in safety. A few curves here and there were less costly than tearing away great hills with steam shovels, and it was deemed best to build the roads around the hills and save the money.

But in the last few years the ownership of motor cars has increased so tremendously that it takes a wide roadway—for motorists want to pass at 50 miles an hour and what some motorists want, they get or do, regardless of the safety of others. It has been necessary in the interest of life and limb, to widen the highways so that the fast drivers can pass without killing others who may impede their way. Likewise, a reasonable amount of speed is now considered essential. The automobile is a quick means of travel from one locality to another and if it is to be quick, it must have an open road. Curves and blind corners are dangerous—and they kill time. The curves have to be taken down, the climbs around hills have to be changed to easy grades over hills; trees and shrubbery that obscure certain sections of the road have to be removed, posts protruding even the slightest into the right

of way have to be painted white so they can be seen even at night. It costs money but is necessary.

None of the things that are being done now could have been foreseen 15 years ago when the first coast highway was constructed. Where the old pavement is being used for the reconstruction, no money is being lost, for the old pavement is furnishing a foundation for the new, wider pavement, that will last for ages. Where the curves are being taken out and more substantial bridges erected, there is little loss, for the old pavement and the old narrow bridges have served their purposes and given the taxpayers their money's worth in most cases.

In some places in California, particularly in Ventura County, the original light construction has been costly to the people, for the heavy traffic of the past few years, particularly by trucks, has torn up much work that must be rebuilt even before the bonds issued to pay for the first have been paid off. This is a hardship upon the taxpayers, of course. In the case of the state highway construction near Santa Barbara, however, the old work is all paid for and the new construction is being done with maintenance and repair funds paid into the state treasury as a gasoline tax by those who use the roads.

And by the way, when the pavement now being constructed between Santa Barbara and Ventura is completed, one of the finest highways in the world will connect Santa Barbara and Los Angeles, and it should result in bringing hundreds of thousands of additional motor parties to this city within the next few years.

*Editor's Note.—A considerable part of the state highway in Santa Barbara County was built originally by the county and not on state standards. The roads followed pioneer routes and were not conceived as a part of a great system of trunk highways for the increased traffic of today.

A Discussion of Cost Accounting on Day Labor Jobs

By B. W. BOOKER, Office Engineer, Division I.

EXPERIENCE in Division I during the last three years in cost keeping on convict and day labor jobs, has resulted in a system being worked out, that I believe, accomplishes the most important function of cost keeping, i.e., the cost per unit from month to month as the job progresses.

It is a simple matter to obtain and analyze the total cost per unit at the end of the job, and to obtain the total cost of each contract item during the progress of the job. The former cost is, of course, useful, as it gives, at the end of the job, a cost which can be used as a basis for future estimates. It is the “post mortem,” necessary and instructive, but made too late to be of any benefit to the job analyzed.

The second cost is worthless and if divided by the quantity

gives a total cost per unit to the date taken, which means nothing.

It is necessary to show the actual cost per unit as the job progresses, to be able to state whether it is comparing favorably with the cost of similar work and to change equipment and methods if the costs are too high. This is the thermometer used in taking the temperature of the job, and it is of direct benefit to the job analyzed if properly interpreted.

Work being done under Day Labor Work Order D-582 (road I-DN-I-C) is a typical job of grading and surfacing in heavy work. It is a prison camp project which has had a total allotment to date of \$520,000, with a total expenditure to December 31, 1926, for construction of \$502,000. The

expenditure per month has averaged from \$15,000 to \$20,000. The principal contract items are clearing, grading, surfacing and culverts. An account of cost is kept of each contract item, and the same system of arriving at the cost to date used.

Costs are divided as follows:

- DISTRIBUTABLE COSTS.
- INVENTORY.
- GENERAL PERIOD COSTS.
- DIRECT COSTS.

DISTRIBUTABLE COSTS—General costs incurred at the beginning and during a job which are properly a charge against all of the items of a contract.

When the job is started a camp must be built, grade trails constructed, construction bridges built; and these things also must be maintained. These are costs which should be borne by all of the contract items in the proportion of each contract item cost to the total cost of the job. The total cost to be borne by each contract item is divided by the quantity of this item and the result is a distributable cost per unit to be added to the direct cost of the item, when reported. The distributable cost is kept in an account by itself, the account being debited as contract items are finished and reported. It is necessary to revise prorations if the actual distributable costs vary greatly from the estimated costs. This proration was changed twice during the two years of work on the D-582 job, and is now \$0.036 per cubic yard of excavation, \$25.41 per acre of clearing, and so on for the other items.

A total of \$32,650 has been spent on the job in distributable costs to date, and \$24,000 of this amount has been distributed to contract items. The remaining \$8,650, plus any additional amount spent in the interim, will be prorated against the contract items yet to be completed.

INVENTORY—That portion of the expense of a particular contract item resulting in partial completion of the item, as plant costs chargeable to but one item, material and supplies.

After the grade trails, camp and construction bridges and roads have been built, or rather after they have been started, the clearing gang and drilling and shooting gangs, are organized and follow in the order named. Clearing in heavy work is performed in from two to three operations, clearing underbrush and small timber, falling large timber, and dragging or cutting the logs clear of the roadbed. That portion of the expense resulting in partial completion of the item is carried in inventory, station by station, on the report, and added to the cost of the item as the item is completed.

The same applies to the drilling and shooting prior to the actual operation of grading. Plant set-ups for surfacing and aggregates, and materials received but not placed, also come under this head.

GENERAL PERIOD COSTS—These are general costs for any period which apply only to the contract items worked on during that period, as the time of the superintendent, time-keeper, blacksmith, etc. These costs are prorated out each period to the contract items, inventory and distributable costs in the proportion of the period expense of each item to the total period expense.

DIRECT COSTS—These are the direct costs of completing the contract item, as the time of the men and equipment necessary to excavate a certain number of cubic yards of grading. To this cost is added the distributable cost per unit, the inventory and the general period cost to arrive at the total actual cost, when the same is reported and carried as a completed contract item cost.

Field Accounting.

To complete the system it is necessary to inaugurate a system of field accounting which will insure that all of the costs of the job to date are in the total reported costs, in the proper contract item account and are segregated according to the requirements of the Accounting Department.

A chart of the total job costs and distribution of same is kept in the field as follows:

As each field requisition is made out it is entered with the field requisition number, the purpose of the requisition, and the estimated cost and date.

When the division requisition number is received it is entered on the same line in the next column with its date.

The purchase order is next entered with its date and amount.

The receiving record with its amount and date is next entered. When the receiving record is entered the job is charged with the amount shown thereon and the amount is distributed to the proper contract item column. There will be as many columns on any job as there are contract items in the job and a column each for Inventory, Distributable Costs and Engineering.

The schedule is entered when received in the next adjacent column.

If the schedule amount differs from the receiving record amount, which has previously been posted, another entry is made showing schedule and purchase order number and the amount of the difference in green ink in the P. O. column. The difference is distributed to the proper contract item account in green ink and a circle placed around the original distribution made from the purchase order amount. This enables the distribution of the scheduled amount to be quickly located.

Distribution of Schedule.

When the schedule is in, the amount is distributed according to the analysis of cost required by the Accounting Department. These subdivisions are as follows:

- A. Salaries and Wages.
- B. Materials and Supplies—segregated into Construction, Small Tools and Supplies, and Commissary.
- C. Service and Expense—segregated into Compensation Insurance, Transportation on Labor, on Equipment and on Material and Miscellaneous.
- D. Equipment Rental—segregated into state and other under this head.
- E. Administration.
- F. Engineering.

A total is struck on the chart each month and the financial statement and monthly cost report made and checked against the chart totals. The monthly cost report contains tables showing Period Costs and the manner of arriving at the same; Distributed and Undistributed Costs, Inventory, Comparative Table of Cost to Date and Preliminary Estimate of Cost; Distribution of Free and Convict Labor by man days; Equipment on job and Equipment Rentals. The monthly report also contains a detailed progress estimate, station by station of each contract item furnished by the resident engineer.

The detail involved in making up the chart is difficult to explain in a brief article and from a casual reading may seem to be cumbersome and not in all particulars necessary. However, when it is considered that all of the information shown on the chart is necessary in making up the various reports required by central office or in keeping a proper record of transactions and costs on the job, the details become clearer. The objects are:

- 1—The listing of each item from original field requisition to final schedule makes an invaluable record which is constantly in use on the job. It also keeps track of material requisitioned and kept the field advised of when the material ordered may be expected on the job.
- 2—The distribution of each item of expense on the job into the various contract items is required by Federal Aid regulations, this being a Federal Aid project, and is also necessary in keeping the actual costs of each contract item.
- 3—The segregation into the objects with their subdivisions is required by the accounting department.
- 4—The monthly cost report with the tables noted therein are required by central office. It is through this monthly cost report that the cost of work is watched at the division office and suggestions made for a change in method when the costs exceed what seems reasonable for any item.

The detailed progress report made by the resident engineer tells exactly where the work has been opened up and where changes can be made without abandoning work completed.

On major jobs the preparation of the chart and monthly report takes most of the time of one man. At the end of the job, however, all of this work has been completed and has been done at the time that each transaction is still fresh in mind. The old system of digging through schedules and guessing at distributions is entirely eliminated. The system has been in operation in Division I long enough to demonstrate that it works satisfactorily.

(Continued on next page.)

SEVERE WINTER EMPHASIZES IMPORTANCE OF SNOW REMOVAL

THE present winter which is probably the most severe California has witnessed for a decade emphasizes the importance of the snow removal activities of the California Highway Commission. With the exception of some activity between Truckee and the Nevada line by Division III and occasional removal work at a few other locations, practically all of the snow removal on state highways is done by Division II and VIII.

Keeping the Pacific highway open is the most important task of Division II. Up to the middle of February snow had been removed on twelve separate occasions in the vicinity of Mount Shasta City, Siskiyou County, which is the headquarters for the crew operating the big rotary plow that clears a path for motorists after each storm. The ice layer which sometimes forms when snow is packed by traffic after the initial work by the plow, is removed by a push plow and scraper operated by a truck or tractor. After the ice is scraped off, the hazard of freezing moisture, which in places



Snow removal by push plow on rock-surfaced Fredonia summit between Westwood and Susanville, Lassen County.

causes a slippery condition, is overcome by scattering sand on the pavement.

Snow Removal on Laterals.

Snow removal work also has been done by the division fifteen or more times this winter on Route 28, between Redding and the Nevada border near Cedarville, Modoc County. The highway between Redding and Weaverville, Trinity County, also has been kept open in a similar manner.

On Route 29, snow removal work has been done over Fredonia Summit, between Westwood and Susanville, permitting all winter travel between these two busy Lassen

County lumbering centers. The latter is a cooperative project, the county furnishing the tractor and the commission the plows and trucks. The commission also pays the cost of operation of the outfit.

None of the routes mentioned were open to all-year travel before the days of the state highway. This fact accentuates the importance of the snow removal program.

Maintenance Superintendent R. A. Tremper is in general charge of snow removal work on the Pacific highway. The foreman in charge of the plow at Mount Shasta City is E. M. Shelton. Maintenance Superintendent J. W. Clarke of Canby supervises the work in Modoc County, which is done by E. B. Johnson, foreman of the crew operating over Cedarville Mountain.

FEBRUARY STORM DAMAGE

AS THIS issue of the Bulletin goes to press reports are reaching headquarters of severe storm damage in Divisions I, II, VII, and VIII, due to the heavy and continuous rains which were general over the state.

Numerous heavy slides occurred on the Redwood highway blocking traffic for several days. The Pacific highway also was closed by a slide in the vicinity of Castella, Shasta County.

Sections of pavement and several bridges were washed out in Division VII, both north and south of Los Angeles. The Los Angeles-San Diego highway was closed to traffic by a washout in San Diego County. A preliminary estimate of the cost of restoring highways in the division was placed at \$270,000 by Division Engineer S. V. Cortelyou.

California, during the calendar year of 1926, registered a total of 1,600,475 motor vehicles. This does NOT include trailers or motorcycles. The total number of trucks registered was 216,323.



Follow-up crew; maintenance outfit scraping ice from pavement, Pacific highway, after removal of lighter snow by plows. Slippery places are sanded to safeguard traffic.

Cost Accounting

(Continued from page 4.)

C. E. Malm, Board of Control Accountant, designated the segregations required by the accounting department, and printed forms have been prepared with these cost analysis headings, leaving the columns for contract item blank, so that they may be used for all types of jobs. It is proposed that the forms be printed on both sides, so that when the binder is laid open the double page will cover most of the distribution columns required on any contract. As many fly sheets as are necessary will complete any number of columns required.

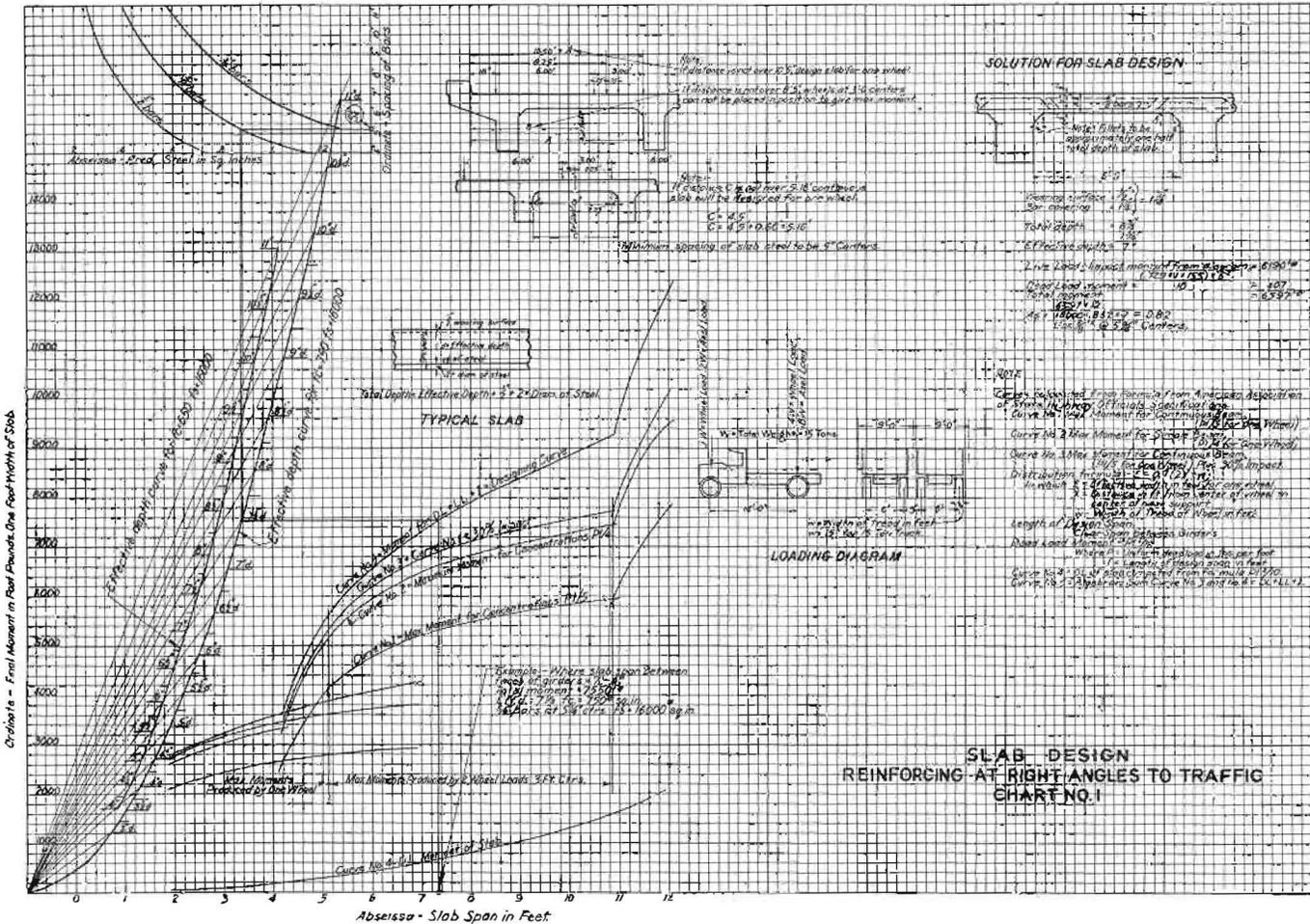
The carrying of the inventory and distributable cost as suspense accounts until the contract item is reported was the idea of Division Engineer T. A. Bedford. The details were worked out by members of the field and office staff of Division I engaged in making and checking the cost reports.

Graphic Charts and Their Use in Bridge Designing

By HARVEY D. STOVER, Office Engineer, Bridge Department.

IN THE design and preparation of plans for bridges where speed and accuracy are required, graphical representation of a series of calculations very often proves of great value. Particularly so, in a case where practically the same problem occurs many times with the fundamental condition of the problem changed but slightly. Also, where use is made of a series of empirical formula, a graph will plainly show any erroneous assumptions or prevent errors which may occur in independent calculations. It is necessary to note, however,

feet on the abscissa and the moments in foot-pounds on the ordinate, a resulting graph can be made (curve No. 1) which will give the maximum moment on a section of slab 1 foot wide for the various spans under consideration. The impact due to the concentrated or live load will be the required percentage of the live load, and by adding this percentage to curve No. 1, we get a curve representing live load and impact, which is noted on the chart as curve No. 3. Curve No. 2 is used only for simple spans and, therefore, is



that, due to changes in specifications for unit stresses and live loads used in design, it is necessary to occasionally revise any chart or graph to keep it up to date.

The accompanying chart No. 1 has been prepared for reinforced concrete slab design with reinforcing at right angles to the direction of traffic, and chart No. 2 has been prepared for reinforced concrete slab design with reinforcing parallel to the direction of traffic.

As a starting point in making clear the use and meaning of the charts, let us first consider chart No. 1. Take for instance, any distribution formula for a concentrated load as applied to slab design; by solving this formula for any given concentration, the distribution width in feet for various slab spans can be obtained. To consider, then, that part of the load to be carried on 1-foot width of slab, it is but another step to obtain the maximum moment that this load would produce for various spans. By plotting the span length in

not often used in slab design. From the calculated weights of slabs that have been designed for various spans, the corresponding dead load moment is shown on curve No. 4. The addition of the ordinate of curve No. 4 to those of curve No. 3 gives the resulting curve No. 5, for use in design.

Since, for any given moment, a slab of 1-foot width would have but one economic depth for a given fiber stress of concrete, by plotting as ordinates the effective required depth of slab in inches and establishing a new abscissa showing area of steel in square inches, another curve can be obtained showing effective depth of slabs for foot of width with concrete fiber stress of 650 or 750 pounds per square inch as required.

Typical Example of Chart's Use.

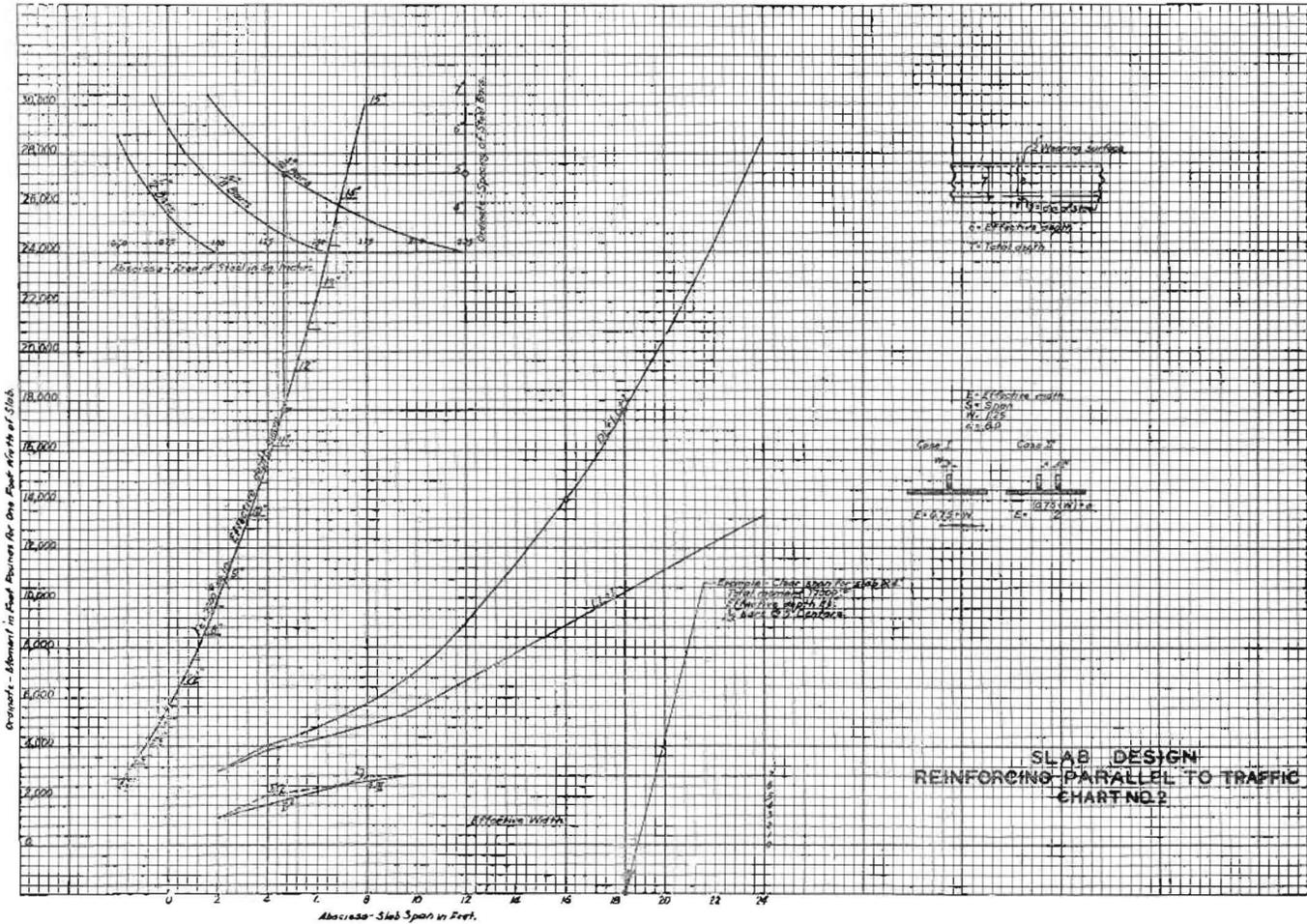
By laying off a known ordinate (steel ordinate) showing spacing of steel bars, a curve can be drawn for the various sizes of steel bars that are used in common practice. To

make certain that the method of using the chart is clear, let us consider, for example, having already found by preliminary studies that the most desirable structure to provide a 30-foot roadway for a given location would be a 3-girder concrete bridge and that the clear span between girders (slab span) is 7' 4", the necessary steps in designing the slab would be to locate 7' 4" on the span abscissa. The moment shown on the design curve (No. 5) is approximately 7500 foot-pounds. By following this on a horizontal line to the effective depth curve, the required effective depth is found to be 7½"; from this point going vertically to the steel curve, we would have half-inch bars at 3½" centers which would be

too close a spacing for practical use. Therefore, we would use ¾" bars at a spacing of 5½" centers.

Chart No. 2 for the design of slabs where the steel is placed parallel to the direction of traffic is similar to chart No. 1 and its use will be self-explanatory.

These charts have proved of great value in checking plans as well as in the preparation of new plans. Similar charts also have been provided for use in designing simple girders and T-girders as used in reinforced concrete bridge design. They save time and make for greater accuracy in the work of the Bridge Department.



TRUCK DRIVER IS FINED FOR RUNNING DOWN MAINTENANCE MAN

DIVISION VI has followed the example of Division Engineer S. V. Cortelyou of Los Angeles in insisting that users of the highways show due regard for the safety of employees of the commission engaged in maintenance work. While at work on the highway in Tulare County recently, an employee of Division VI was struck down by a truck, the driver of which did not stop but endeavored to get away. The number of the vehicle was secured by another member of the crew after a long chase.

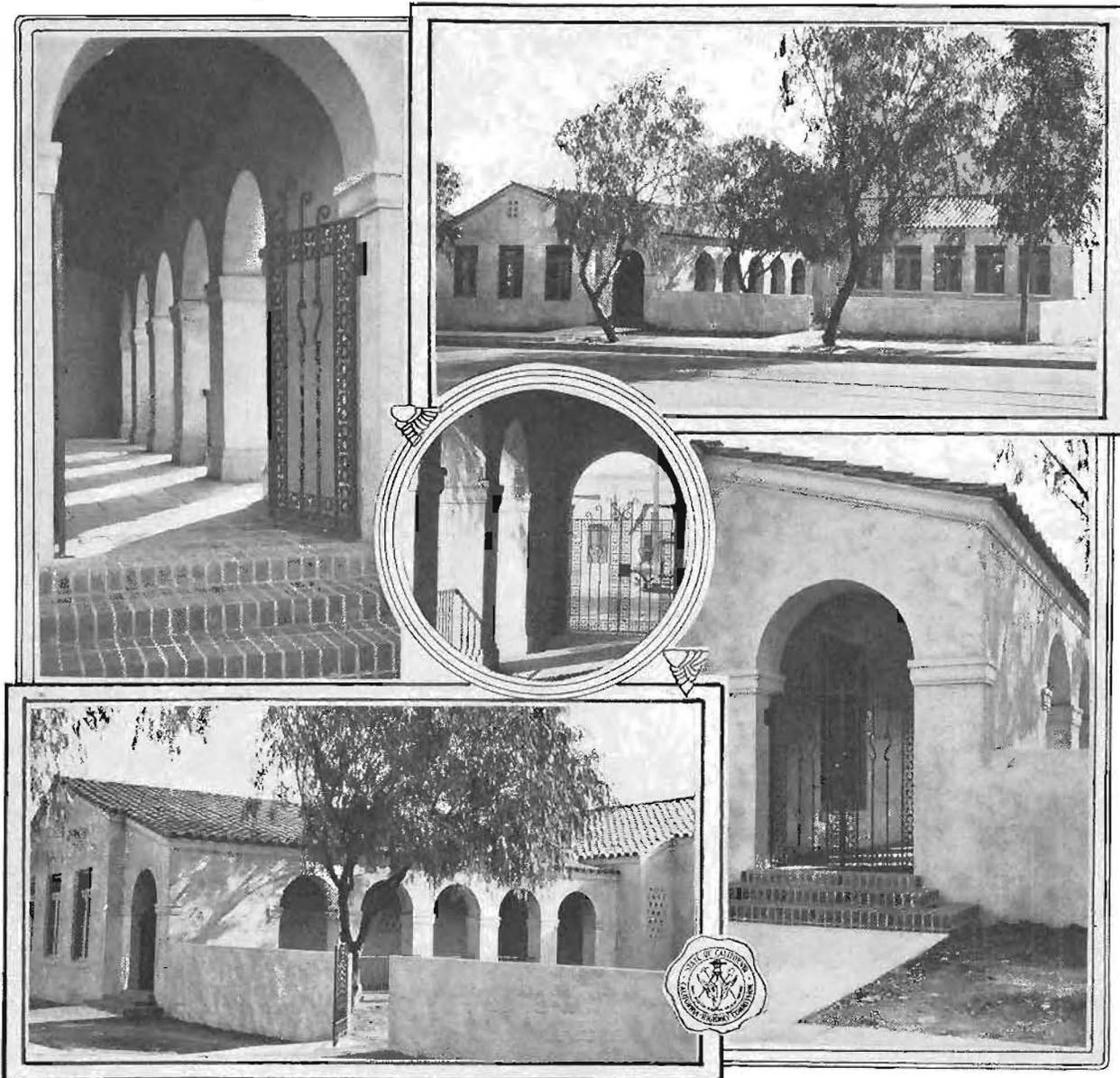
The truck driver was arrested on a felony warrant charging him with failure to stop and render assistance to the injured man. During the hearing before Justice of the Peace J. L. Swanson, of Pixley, the charge, with the consent of the

injured employee, was reduced to one of reckless driving. The truck driver then paid a fine of \$50 and promised to exercise extreme care in the future while passing men at work.

Maintenance employees endeavor at all times to serve the convenience of the public, but they are necessarily required to place themselves in places of danger, and drivers owe them the legal and moral duty of exercising care when passing points where work is under way, it is pointed out by Acting Division Engineer E. E. Wallace.

The division announces its determination to follow up all similar cases of injury to maintenance employees. It will insist that all offenders be brought before the courts without delay.

San Bernardino Division Headquarters Credit to State



BEAUTY AND UTILITY—Views of the new division office building of the California Highway Commission at San Bernardino.

LOCATED near the business district and near the very spot on which the original settlement was made, the new division buildings of the California Highway Commission in San Bernardino have been completed and are now occupied by the staffs of Division VIII and the Equipment Department. The architecture of the office building is Spanish with an adobe effect, in keeping with the historic traditions of the site which adjoins that of the old fort and stage station of early days. It is of concrete and tile construction. The shop and maintenance buildings are of standard construction of concrete, timber, and galvanized iron.

The office building has floor space 80 by 85 feet with ample basement room for storage of supplies. A large fireproof vault also is located in the basement for the safe keeping of division records. The building was planned by Howard E. Jones, San Bernardino architect, and was erected by George

Herz and Company of San Bernardino, contractors, at a cost of approximately \$30,000. Spanish atmosphere is a special feature of the building which is colored in soft tints, while the roof is of varied shades of red tile.

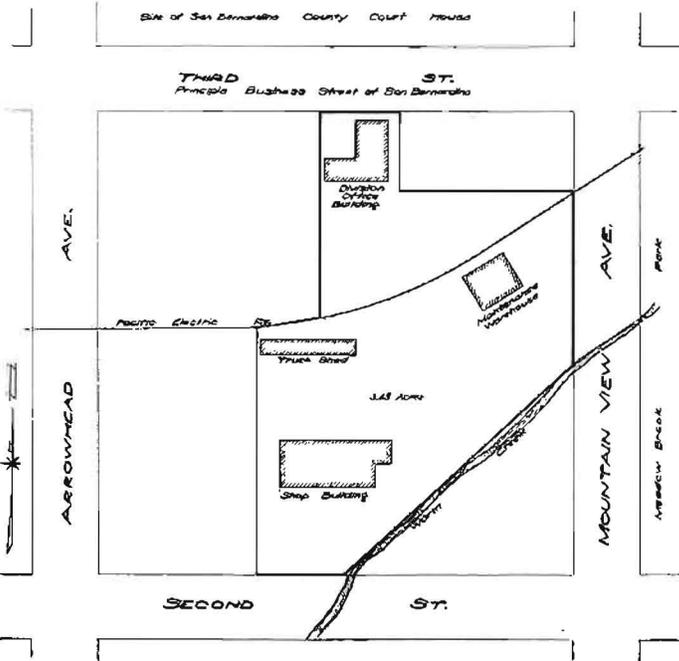
The shop building is 60 by 140 feet and the truck shed is 26 by 126 feet. Both buildings were erected by Houghton and Anderson, contractors of Los Angeles, at a cost of approximately \$25,000. They are served by a spur track of the Pacific Electric Company.

The buildings have been erected on a state-owned site of nearly three and a half acres. The division office building faces on Third street and is opposite the site of the new San Bernardino County court house, which is now under construction and nearing completion.

The site was purchased by the commission, with the approval of the Board of Control, in 1924, for \$10,000. The

growth of the district has so increased values that the property, exclusive of the improvements, is now appraised at several times the price paid three years ago. Besides ample space for parking and for the enlargement of present shop and office facilities, there is room for the establishment of a nursery, where it is proposed to propagate shade trees and ornamental shrubs for planting around maintenance stations and along the highways of Southern California. A flowing well of excellent water is located on the property and a running stream borders the tract on the east, while just across this stream is Meadow Brook park.

Division VIII was created in 1923, taking over from Division VII the management of highway construction and maintenance



in San Bernardino, Riverside, and Imperial counties. Prior to the erection of the division office, the staff of Division Engineer E. Q. Sullivan was temporarily housed in the San Bernardino City Hall through the courtesy of the city government. This space, however, was needed by the municipality, which moved the commission to acquire its own permanent headquarters for the division.

Our automobile figures run into millions, and so, apparently, do our automobiles.
—American Lumberman.

SETTING THE EXAMPLE—AN EDITORIAL ON FIRE PREVENTION

(From the Napa Journal.)

DESPITE the fact that there is now in force a state law making it a misdemeanor to throw lighted matches, cigarettes or cigars from moving vehicles onto the highway, it has been found necessary to spend still more state money in the direction of fireproofing both sides of state roads. This work, which involves the removal of all forms of debris from the roadsides in Tuolumne, El Dorado and Mendocino counties, is being done by forest rangers under the direction of the State Board of Forestry and the State Highway Commission.

It is difficult enough to apprehend perpetrators of deliberate arson; there are very few convictions on record for this crime. The motorist who throws lighted smokes from the window of his car is a form of firebug even more difficult to detect and arrest. Even motorists who see the act committed by another are apt to hesitate about testifying against him. The habit is just a habit, and it is a bad one that should be corrected.

The owners of cars not now equipped with a metal ash receiver should see that one is provided. They cost but a few cents and are easily attached to the indicator board. The trouble is that one sees another flick a cigarette and then follows suit unconsciously. Conscientious motorists, by breaking themselves of the habit, will set a good example that the careless driver may be in time inclined to follow.

SAFE AND SOUND.

Stop and let the train go by,
It hardly takes a minute;
Your car starts off again intact,
And better still—You're in it.
—Boston Transcript.

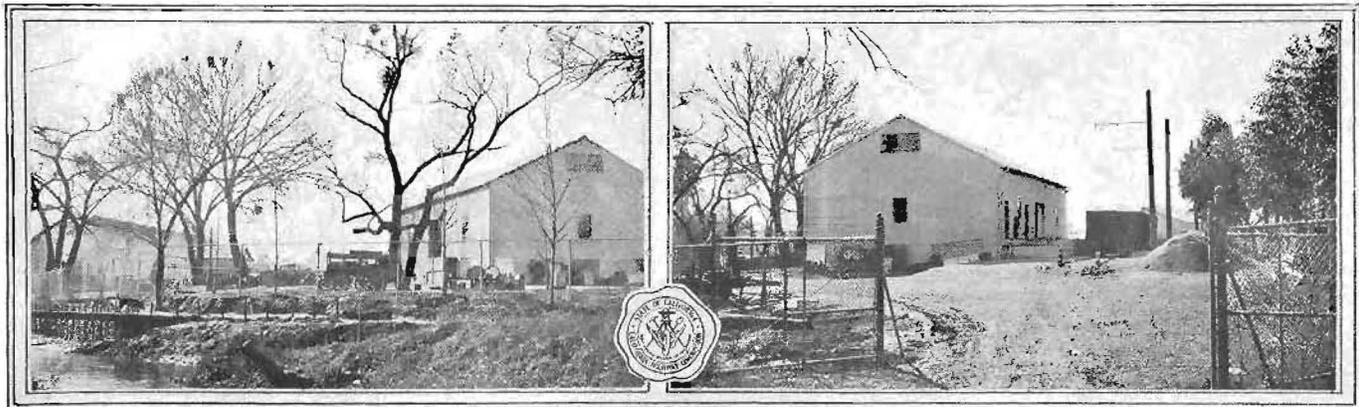
MAINTENANCE MAN MEETS DEATH.

While driving to the point where he was to take up a count of traffic early on the morning of January 16th, Carl Richardson, maintenance employee of Division I, was killed, when his automobile left the road and was wrecked. His twelve-year-old son, who was with him, also met death in the accident. It was dark and raining hard when Richardson set out for his post of duty. The accident occurred in the vicinity of Bartlett Mountain in Lake County.

The dead employee is survived by a widow and a large family of children.

INSURANCE FOR ENGINEERS.

The American Association of Engineers has perfected plans for "Unemployment Insurance" for professional engineers. The American Association of Engineers will presently arrange to cause this insurance to be written, all of which will be another step forward towards the welfare of the engineer.



SAN BERNARDINO SHOPS—New shop and warehouse buildings of the California Highway Commission at San Bernardino, headquarters for San Bernardino, Riverside, and Imperial counties. (Photo by Division VIII.)

UNIQUE EARTH MOVER IN USE ON PENINSULA HIGHWAY

A NEW and unique piece of road building equipment which may prove of great value in highway construction is now being demonstrated on the Peninsula highway, in San Mateo County, by the Kaiser Paving Company of Oakland, contractors for grade widening operations in the vicinity of Cypress Lawn cemetery. The machine is a telescoping earth mover which is capable of excavating, moving, and depositing, in one continuous operation, as much as 15 cubic yards of material. It is designed for operation as a one-man unit by R. E. Le Tourneau of Stockton, the inventor.

The machine already has been used by the Kaiser Company with considerable success in the building of an earth-fill dam. Where soil conditions permit, its use on roadway excavation and embankment may be an interesting development of highway construction. On the Peninsula contract the sandy nature of the soil had made for its maximum efficiency in operation.

Engineer Describes Operation.

The following description of the operation of the Le Tourneau invention has been prepared by Resident Engineer H. S. Payson, of Division IV, for the benefit of the engineering staff of the commission:

The Le Tourneau machine consists of five telescoping compartment without backs, each 7 x 3 x 3 feet in size; the first is fastened rigidly to the frame and has attached to it the cutting edge of the apparatus. The frame is mounted on caterpillar tracks by being pivoted on a central axle. The vertical movement of the cutting edge is operated by an electric motor through a rack and pinion. The horizontal movement of the compartments is operated by another electric motor mounted on the tail gate, also through a rack and pinion. Electricity for the motors is produced by a generator mounted on the 60-H.P. caterpillar tractor to which the machine is attached. The generator is driven by a belt from the fly-wheel of the tractor. Switches are conveniently located for the tractor operator, one being at his foot and the other at the side of the seat for operation by hand.

As previously explained, the number one compartment is fastened rigidly to the frame, or chassis, and into it are nested the other four compartments. In loading, the frame is depressed so that the cutting edge is excavating all the cut that the two tractors can make without slipping their tracks.

Compartment number five is loaded first and is pulled back by the tail gate, exposing compartment number four which receives its load as number five is receding. Number five recedes until its front end rests on the back end of number four; it then picks up number four and takes it along with it. Compartments five and four continue in backward motion exposing number three, which begins to receive its load, and so on, until the front end of compartment number two rests on the back end of the fixed compartment number one. When fully loaded, the machine appears to have but one compartment, fifteen feet long, instead of one three feet in length, as at the beginning.

To unload, the action is simply reversed. Compartment number two slides into number one, pushing the material out of number one, while the cutting edge is lowered to the desired spreading elevation. Then compartment number three slides into number two, and so on. When compartment number five reaches its forward position inside the others, the tail gate slides through emptying the entire load except the small amount of material on the cutting edge.

Action is Continuous.

The loading and unloading action is steady and continuous and is controlled by the electric motor on the tail gate, which in turn is operated by the switch at the driver's seat.

There is no operator on the machine, other than the driver of the tractor, as the two reversing switches control all the movements of the compartments.

When loaded by one 60-H.P. tractor, a load of 8 to 10 cubic yards is handled, but when assisted by a snap tractor

a load of 14 to 15 cubic yards may be moved at one time. A snap tractor will take care of three or four machines, according to the length of haul.

When the machine arrives at the loading point, a short stop is necessary to hitch on the snap tractor. After the cutting edge has been lowered to make a 3- or 4-inch cut, both tractors start in low gear and the tail gate is run back just fast enough to allow the sections to become loaded. An efficient operator is not satisfied unless the material is well heaped up and falling off the sides.

When the machine is fully loaded another short stop is necessary to detach the snap tractor; the front end is elevated and the load transported on the caterpillar truck in high gear (5 to 6 miles per hour) to the embankment. To deposit the excavated material the front end is lowered so that the cutting edge clears the ground from one to six inches, depending on the spread required. Spreading is usually done in low gear in order to supply sufficient electricity for satisfactory operation of the electric motors. It is difficult, it would seem, to deposit material in lifts greater than 8 to 10 inches, and for this reason the machine does not lend itself readily to filling small areas, as around buildings, but works best on long cuts and fills. Eight to ten minutes are required to make a com-



SUPER EARTH MOVER—Views of a Le Tourneau earth mover in use by contractor on Peninsula highway widening project, San Mateo County. Above, caterpillar tractor with snatch; below, mover lifting full load of approximately 15 cubic yards of material.

plete round trip on a 1200-foot haul. A maximum loading is possible on minus grades.

The Le Tourneau machine is electrically welded throughout and is without bolts or rivets except those used for making electrical contacts. No accurate cost data are available as yet, but on the basis of a rental of \$100 per day a movement of 400 to 500 yards would make the cost approximately \$0.25 a cubic yard.

For the most satisfactory results in excavation, cuts should be 200 feet or more in length and the material to be excavated should be of such a nature that its movement may be really accomplished by plowing or by use of scarifiers and Fresno scrapers. It is hardly probable that these machines will prove successful in rocky formations, requiring heavy blasting, or in comparatively narrow cuts. The track requires a width of eleven feet for ease of operation and clearance.

Compacting of fill material moved by the machines on the Peninsula highway, however, has been very satisfactory. It was

Decision Gives Prison Road Workers Accident Compensation

PRISONERS from the state penitentiaries employed in the construction of highways come within the provisions of the California Workmen's Compensation Act and in case of injury are entitled to compensation. This decision of the State Supreme Court, in the case of the California Highway Commission vs. the Industrial Accident Commission and Robert Smith (72 Cal. Dec. page 582), is of considerable importance and has attracted much interest among those interested in development of the prison road camps.

The decision was rendered in the case of Robert Smith, a negro, who became blind as the result of an injury received in a premature blast on the Yosemite all-year highway. His case was fought through the commission and the courts to success by Milton J. Schmitt, an attorney of San Francisco, himself blind.

An effort is now being made by the highway commission and the management of the State Compensation Insurance Fund to determine the best method of providing the additional insurance for the men in the camps which the decision has made necessary. The amount of additional premiums which will be charged, the commission has not yet been determined.

The Court's Opinion.

The opinion of the court is, in part, as follows:

Certiorari to review an award of the Industrial Accident Commission. * * * Robert Smith. * * * on March 10, 1922, was sentenced to state prison for a term of from one to fifteen years. After serving the minimum sentence of one year the board of prison directors fixed his full sentence at five years. Shortly thereafter Smith made application and was granted permission to perform work on the public highways of the state under the direction of the State Highway Commission, he being eligible for this privilege. One of the benefits enjoyed by prisoners assigned to this character of work is a credit on the sentence to be served of two days for every one day of service at highway work. Shortly after his assignment to a prison camp, chapter 316 of the laws of 1923 became effective. This act provides, among other things, for the payment of compensation to a convict for work so performed by him, and Smith received the benefits conferred by the act.

On March 17, 1924, while performing his duties as a road laborer he was struck by flying fragments from an accidental explosion of a blast, causing him various and serious bodily injuries, including injuries to both of his eyes. Smith was thereupon returned to the hospital at San Quentin for treatment. Upon his discharge from the hospital he remained within the prison until he was finally paroled on account of the severe injuries he had received. His credits materially reduced the term of his sentence which was completed on June 25, 1925, at which time he was finally discharged from custody.

On August 25th, following, he filed an application with the Industrial Accident Commission for disability benefits by reason of his injuries. The state insurance fund was the insurance carrier and it was joined as a defendant in the proceeding. The commission made an award in favor of Smith. It provided for the payment to him forthwith of the sum of \$791.52 as compensation for permanent disability and beginning with March 10, 1926, the further weekly sum of \$7.76 for a period of 138 weeks, and after the expiration of that time, the weekly sum of \$4.79 for the remainder of

his life. The award was made upon the theory that the relation of master and servant existed between California Highway Commission and the applicant by reason of the provisions of the act of 1923, providing for the payment by the commission to convicts for services performed by them on the state highways.

The sole question, therefore, that is here presented is whether or not a convict engaged in the performance of labor on a state highway under the provisions of chapter 316 of the laws of 1923 is an employee within the meaning of the Constitution and Workmen's Compensation Act.

There is no provision either in the organic law or the statutes which directly includes or excludes them as such. The question, therefore, concerning what relationship exists between the state and an incarcerated convict so employed on the highways involves the proper construction to be given to the various laws relating to the subject. * * *

In the year 1923, the legislature enacted what is generally known as the Convicts Road Camp Bill (Stats. 1923, chap. 316, p. 667). This act, among other things, provides that the State Highway Commission may employ or cause to be employed on the highways of the state certain convicts confined in the state prisons, and that when so employed such convicts shall receive a specified compensation not exceeding seventy five cents net per day for their labor.

Provision is also made for authority of the prison directory to send the number of convicts to a prison camp as may be requisitioned by the commission. Under these conditions it is respondents' claim in the support of the award that this act entirely changes the status of convicts who may be assigned to work on the highways, and creates a new class of paroled prisoners between whom and the state a relationship is created, one of the incidents of which is a liability under the Workmen's Compensation Act for injuries.

Respondents seem to concede that while engaged in work within the prison walls, this claimed relationship does not and can not arise, but they insist that there is logically and necessarily a real, definite and distinct difference between the status of a convict within and one without the prison walls performing work upon the highways under the provisions of the act in question that as to the latter it was the intention of the legislature as evidenced by the use in the act of the words "employ" and "employment" to authorize the State Highway Commission to enter into a contract of employment with convicts released for such work. We are of a like opinion. It may be conceded that one serving a sentence of imprisonment in a state prison is, in contemplation of law, a prisoner therein, as well when at work outside, under surveillance of the prison guards, as when confined within its walls (Bradford vs. Glenn, 188 Cal. 350).

The power, however, to deprive a prisoner of his civil rights is one that resides in the legislature. The power to thus deprive a prisoner of such rights must include the corresponding power to restore them. This we think was the manifest intention and purpose of the Convicts Road Camp Bill. The legislature is in keeping with the modern idea that it is for the benefit of society to rehabilitate those possessing criminal instincts and one of the means employed is to partially restore to them their civil rights to contract for their labor as an encouragement to that end. The act so expressly indicates, for it provides by the very first section thereof that the "State Highway Commission may employ or cause to be employed, convicts confined in the state prisons, etc."

In the same section it is provided that all convicts so employed shall receive the compensation provided for, and

(Continued on next page.)

EARTH MOVER IN USE ON PENINSULA HIGHWAY

(Continued from page 10.)

found impossible to make an impression on completed fills with sheep-feet tamping tractors (Fordson).

The cost of operation should be less than for shovel and trucks of equal capacity because of the lesser number of men required as well as a reduced consumption of gasoline and oil. The machines undoubtedly merit close observation by highway builders.

Eleven

A tourist driving over a reconstruction job near Merced, just after the concrete shoulders had been completed, stopped and remonstrated with the long suffering resident engineer.

"I think," said he, "the highway commission is making a serious mistake in building the sidewalks so high and so close to the pavement."

The dentist had been trying to collect a bill for a set of false teeth.

"Did he pay you?" asked his wife.

"Pay me! Not only did he refuse to pay me, but he actually had the effrontery to gnash at me—with my teeth!"—Good Hardware.

BOARD OF CONTROL EXPERT TO HEAD ACCOUNTING DEPARTMENT

THE appointment of William Schleip, formerly of the staff of the State Board of Control, to the position of Principal Accountant for the California Highway Commission has been announced by the State Highway Engineer, effective as of February 1st. Mr. H. B. Weaver remains in charge of the Headquarters accounting office.

Mr. Schleip has had many years of experience in connection with the financial affairs of the state as superintendent of accounts for the Board of Control and is well qualified to assume his new position. In announcing the appointment, Mr. Morton said:

Now that our revised accounting systems are in use, it is desirable that the accounting become a well defined department of the highway organization. As Principal Accountant, Mr. Schleip will have supervision over the personnel in the various accounting offices and responsibility for results. His supervision will also extend to modifications of the systems, preparation of accounting data, and financial control reports.

CUBA AWARDS RECORD CONTRACT.

A special Board of Award has recommended to the President of Cuba the award of the largest highway building contract on record. It proposes an expenditure in a single contract of nearly \$76,000,000 for the grading and paving of a central highway for the entire length of the Island from Guane, Province of Pinar del Rio, to Santiago de Cuba, 750 miles. The paving of the highway is declared an economic necessity for the development of the social and business life of Cuba and for the greater attraction of tourists.

The proposed expenditure is at the rate of over \$100,000 per mile. It will be paid for by the collection of special gasoline and other taxes.

COMPENSATION DECISION

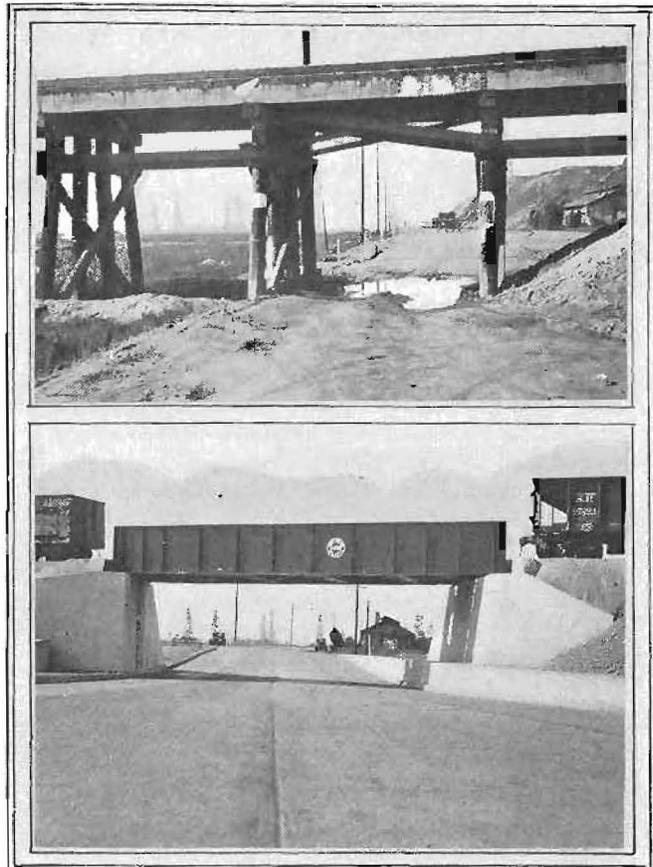
(Continued from page 11.)

such compensation is referred to as earnings. The word "employ" has a definite legal meaning and legal terms when used in a statute are to be construed according to the context and the approved usage of language unless a different sense is obviously intended. (Civ. Code, sec. 13; Fidelity and Casualty Co. vs. Ind. Acc. Comm., 191 Cal. 404.) There is nothing contained in the statute which indicates that a different meaning was intended. On the contrary, its manifest object was to authorize those who were afforded the privilege to enter into a contract of employment with the State Highway Commission to have restored to them the limited civil right which the reformatory measure provides for. The statute as a whole should be liberally construed to carry out its beneficent purposes. (Western Ind. Co. vs. Pillsbury, 172 Cal. 807.)

It was in evidence and it is not disputed that it was optional with prisoners as to whether they would accept this labor or not. They were at liberty to refuse it and in some instances it had been refused. Having accepted it, however, the applicant was entitled to all the rights under the act, one of which must be held to be the benefits enjoyed by employees under the Workmen's Compensation Act. The legislature having the power to restore the suspended civil rights of a convict and having the further power to compensate them for the character of the work in question, it follows that the sum provided for does not constitute a gift under section 34 of article IV of the constitution, as suggested by petitioners.

We conclude, therefore, that under the terms of the Convicts Road Camp Bill the legislature intended to restore to a convict assigned to work upon the public highways such limited civil rights as are necessary to create the relation of master and servant between him and the State Highway Commission, and this being so, he must be held to be an employee within the meaning of the Workmen's Compensation Act. It follows that the applicant is entitled to all the benefits of this act and the Industrial Accident Commission was correct in so concluding.

For the reasons given the award is affirmed.



BRANAGAN SUBWAY—Before and after views of a recently completed improvement on the south coast highway near Newport Beach, Orange County.

BRANAGAN UNDERCROSSING

Completion of the under crossing separating the highway and the Southern Pacific Railroad at Branagan, Orange County (VII-Ora-60-A) is announced by the Bridge Department. This structure is located on the Newport-Serra section of the new south coast highway. It was built at a cost of approximately \$25,000.

The plans provided for two concrete abutments with wing walls, and the grading and paving of the roadway and sidewalk. Steel girders supporting the railroad track were placed by the railroad company.

W. M. Ledbetter and Company, of Los Angeles, was the contractor. A. L. Richardson was resident engineer for the commission.

SOLANO PROFITS BY BOND PURCHASE.

THE sale recently by Solano County of \$200,000 worth of State Highway Bonds to a San Francisco bond house is reported by the Vallejo *Times-Herald*, and brings to notice benefits which have accrued to the county by reason of the original purchase.

The bonds were acquired twelve years ago with surplus county funds. During the period the county has held the bonds, it has received \$96,000 in interest. The funds received by the state, when the bonds were purchased, helped to complete state highways which have been in use by motorists for a considerable period.

It would be interesting to know, if the facts were determinable, the amount of dividends received by motorists in decreased operating costs because of the expenditure in Solano County of the original \$200,000. And the county still has its \$200,000 in cash.

INVERTED PAVEMENT SECTION PREVENTS EROSION OF FILL

AN INVERTED section to prevent erosion by drainage of the high sand fill at the approach to the M street bridge, West Sacramento, was an outstanding innovation of a paving project recently completed under the direction of Division X. The contract is a part of the commission's program of improvement of the entrances to the state capital. By building the new M street approach, both the M street and Southern Pacific bridges across the Sacramento River have been made available to traffic entering or leaving Sacramento from the west.

It was thought it would be necessary, when the project was first considered, to include curbs and gutters in the pavement design to prevent erosion of the fill by such drainage as would result from the usual crown section. To overcome this, it was decided to depress the pavement and carry the drainage down the center. This was accomplished by dropping the inside edges of the outside 10-foot sections (30-foot pavement placed in three strips), 1½" and an inch more to the center of the middle section. This made a total depression from the outside edge of 2½ inches.

Two concrete catch basins were placed beneath the center of the pavement, one-half way down the steepest grade and the other at the foot of the grade where the transition was made to the standard crown section. Water is drained from these catch basins by metal pipes and the basins are covered flush with the pavement by cast-iron gratings.

There has been considerable heavy rainfall since the job was completed, but the division reports results have been satisfactory.

H. Brown of Sacramento was the contractor for the building of the pavement. This was placed in three 10-foot

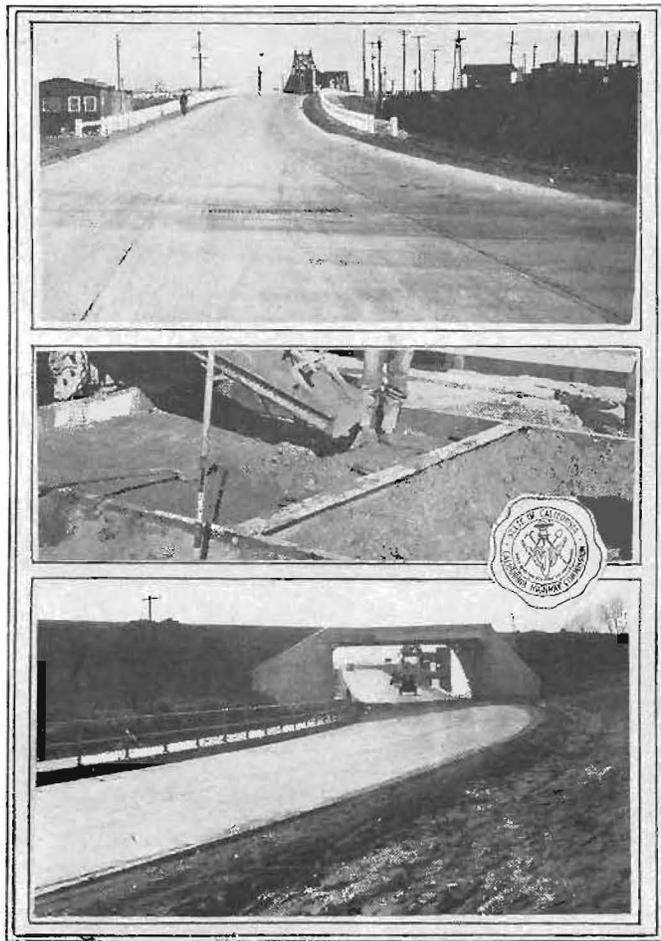
mixer. Aggregates were measured in three measuring hoppers suspended under bunkers. C. A. Potter was resident engineer on the project, having as assistants at various times L. E. Ford and G. C. Harden.

The new section of pavement at West Sacramento is .55 of a mile in length. The westerly end passes through the new subway under the tracks of the Sacramento Northern Railway, the building of which was discussed in the May, 1926 issue of the Bulletin, page 11. The easterly end leads up on an easy grade to the M street bridge. It was built on a fill made by sluicing sand into place after it had been obtained from the bed of the Sacramento River by means of a clam shell dredge. This sluicing process was described in the April, 1926, issue



strips, each 7" thick in the center, increasing to 9" in the outer two feet. Transverse bituminous expansion joints ½" wide were placed at intervals of 50 feet. Each joint in each strip is supported by five ¾" by 24" dowels, with one end fixed and the other free in a slip joint. No longitudinal expansion material was used as the two outer strips were placed first, which left a cold joint when the center strip was poured several weeks later.

Ford dump trucks were used for hauling aggregates to the



AT WEST SACRAMENTO—Above, new 30-foot pavement at approach to M street bridge; note center drain in pavement; center, method of holding transverse joints and dowels in place; below, new subway on improved alignment with safety walk for pedestrians.

of the Bulletin, pages 3 and 13. A blanket of clay soil over the sides of the fill protect it from erosion by wind action.

Not the least of the difficulties in connection with the building of the M street approach was the securing of right of way. It was necessary to go to trial in eminent domain proceedings in the Yolo County Superior Court to secure an easement over 3.03 acres of the O'Connor and Harbinson property, immediately west of Second street, in Broderick. The owners asked \$91,700 for value of right of way and damages. The jury after hearing the evidence of the defendants and the state, made an award of \$5,030. A. M. Nash, right of way agent for Division X, assisted in gathering the evidence for presentation in court.

WHAT THE DIVISIONS ARE DOING

DIVISION III.

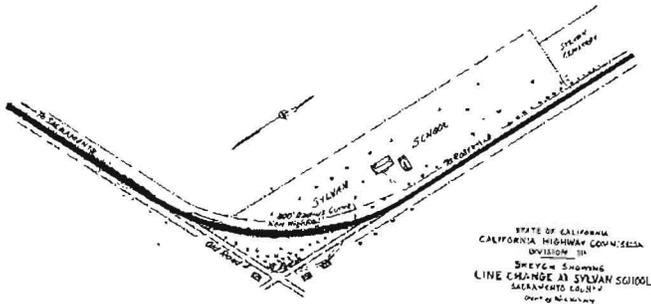
HEADQUARTERS, SACRAMENTO.

F. W. HASELWOOD, DIVISION ENGINEER.

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

THE line change at the Sylvan school corner on the Sacramento-Roseville highway (road III Sac-3-B) is being graded by C. R. Merrill, contractor, and by the time this is in print it is probable traffic will be using the improved line. It consists of an 800-foot radius curve which replaces a sharp turn with a 30-foot radius. What was formerly a very dangerous intersection is now a long, sweeping curve on pleasing alignment.

The board of trustees of the Sylvan School District is to be commended for its splendid cooperation. The district



complimented Foreman Gaston on the fact that the road throughout is safer and in much better condition than ever before.

Satisfactory progress is being made on the improvement of the Yosemite highway from Merced to El Portal. Four rock crushing plants are now in operation, two by convict



Line change to eliminate stream crossings on Coalinga lateral, western Fresno County, Division VI.

labor, one by contract, and one by maintenance forces. New bridges are now complete and narrow sections are being widened and surfaced.

An additional allotment of approximately \$20,000 has been authorized by the Commission and surfacing work between Mariposa and Briceburg will be continued.

DIVISION VII.

HEADQUARTERS, LOS ANGELES.

S. V. CORTELYOU, DIVISION ENGINEER.

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

transferred to the state that part of the school ground necessary to make the change possible. The state also acquired title to a clump of oak trees on the outside of the curve and between the new right of way and the old road. This will preserve the beauty of the roadside by preventing its use for commercial purpose.

Division III is now acquiring rights of way preliminary to the widening and thickening work planned between the Sylvan School and Roseville.

Division III is also engaged at this time in revising the standard of alignment of several grade separations on the Auburn route between Sacramento and Lake Tahoe.

DIVISION VI.

HEADQUARTERS, FRESNO.

E. E. WALLACE, ACTING DIVISION ENGINEER.

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

MAINTENANCE crews recently completed the oiling of several miles of shoulders along Route 4 in Tulare County with satisfactory results. The oil has bound the sandy soil and sealed up the clay. Shoulders are now held more firmly to pavement edge, preventing surface water from penetrating the subgrade. The oiling also has proved of much benefit in keeping the pavement clean and free from mud which formerly was carried onto it from the dirt shoulders.

An unusual feature of the work is the fact that much of the oil used was salvaged from pipe line leaks along the roadway.

Improvements Made on Lateral.

Considerable improvement work has been done on the Sierra-to-the-Sea lateral in western Fresno County by the maintenance crew of Foreman O. D. Gaston. The old county road, in one place, followed a creek bed for half a mile and in others unnecessarily crossed the stream. By making three channel changes and by building about 1000 feet of new grade, the road has been removed from the bed of the stream and considerably shortened. Residents of the district have

ALL cement concrete pavement is now in place on the Oxnard-Hueneme cutoff on the Coast highway in Ventura County, and construction of rock shoulders is in progress. The test sections placed on this unit are attracting much attention among engineers and the public generally.

Damage to the subgrade done by recent earthquakes and storms having been repaired, placing of cement concrete pavement is now in progress on the Mountain Springs grade in San Diego and Imperial counties. Jahn and Bressi are the contractors.

A strip of concrete pavement 10 feet in width has been laid the full length, 3.2 miles, on the contract for reconstructing Whittier boulevard. Los Angeles County, between Michigan avenue, Whittier, and the Orange County line. Placing of concrete on the other two 10-foot strips, to complete a 30-foot pavement, is now in progress.

Construction of the new state highway through Laguna Beach, Orange County, 1.54 miles, has been started by the contractors, the United Concrete Pipe and Construction Company of Los Angeles.

DIVISION X.

HEADQUARTERS, SACRAMENTO.

R. E. PIERCE, ACTING DIVISION ENGINEER.

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

MAINTENANCE crews of Division X are engaged in placing gravel shoulders on the Sacramento-Davis highway between the Yolo causeway and Davis. This stretch of highway is heavily traveled. It is expected that the increased width made available by the gravel shoulders will be an aid to traffic until such time as funds are available for pavement widening.

HIGHWAY NEWS NOTES

THE Kiwanis Club of Eureka entertained recently at a dinner dance at the Eureka Inn in honor of the appointment of Mr. Ralph W. Bull, a member of the club, to the chairmanship of the California Highway Commission.

In Santa Ana, the appointment of Mr. J. P. Baumgartner, as a member of the commission, was celebrated by the holding of one of the famous Orange County "rump" conventions, in which leaders of all parties participated.

Engineers and employees of Division VII presented Nelson T. Edwards, the retiring commissioner, with a beautiful desk set as a token of appreciation of his interest in their welfare during his term of office.

J. M. O'Malley has been transferred from Shop 6, at Fresno, to Redding, where he will be in charge of Shop 2 as superintendent. He takes the place of R. A. Allen who is no longer with the department.

R. J. Carlisle of Fresno has been appointed superintendent of Shop 6, it is announced by R. H. Stalnaker, Equipment Engineer.

R. P. Green, formerly of Division I and later with headquarters, is now chief draftsman for Division III.

Thornton May of the Bridge Department and J. E. Stewart of Division X, both draftsmen, have been loaned to the Montana State Highway Department and have left for Helena, which will be their headquarters for the next three months.

Division VII News.

C. V. Kiefer, Assistant Engineer, was recently married to Clara M. Jarde, of San Pedro.

R. D. Kinsey, Assistant Resident Engineer, has married Dorothy Norton, of Escondido.

Bessie V. Lee, bookkeeping machine operator, has resigned her position to become Mrs. Albert Schencken.

Hugh Henry, popular maintenance foreman at Santa Ana, is the proud father of a dandy boy, Spencer Jackson Henry.

BRIDGE DEPARTMENT NEWS

A. B. Willett has completed his work as resident engineer on the five Imperial County timber bridges, built by Wm. Ledbetter, contractor, and has been assigned to the bridges over San Juan Creek, on the Coast highway, Orange County.

William Carpenter has been assigned to the Klamath River bridge as assistant engineer.

The bridge across Bear Creek, near Briceburg, is now complete and open to traffic. M. J. Dwyer, who was resident engineer on this contract, has resumed his duties in the Grade Separation Division of the Bridge Department.

G. C. Swan, assistant to A. L. Richardson on the Santa Ana River bridge, will be resident engineer on the Pomona bridge, to be built by the Division of Architecture.

W. G. Remington, resident engineer on the San Jose Creek bridge, has taken over the work at Gaviota Creek bridge, succeeding L. De Cew, who has accepted a position with the Engineering Department of the city of San Bernardino.

DIVISION REPORTS

(Continued from page 14.)

Division X forces are busily engaged in regraveling sections of highway in the Mother Lode section as follows:

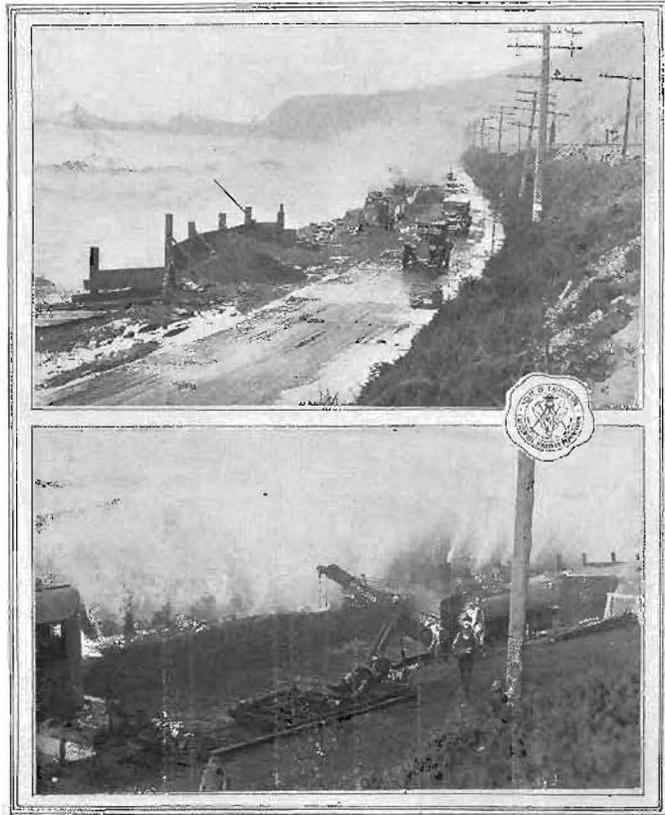
Keystone to Jamestown, Tuolumne County; Valley Springs to San Andreas, Calaveras County; and Harold to Lone, Amador County. The work is being done to prepare these stretches for oiling treatment during early summer.

Work on the line change at Plymouth, Amador County, is progressing as rapidly as the inclement weather will permit.

Three widening jobs of great interest to the public have been undertaken by Division X. The narrow and treacherous Mokelumne River grade, south of Jackson, Amador County, has been widened to such an extent that two cars may now pass easily at any point, which was impossible before. Blind curves also have been widened and daylighted to allow for greater safety.

Melones grade in Tuolumne County, feared by so many motorists, has been widened and improved so that no one any longer should have any fear about driving over it, regardless of the amount of traffic on the road.

Fifteen



HIGH SEAS AT RINCON—Waves washing over contractor's coffer dam during recent storm. Views demonstrate necessity for strong concrete wall to protect state highway at this point.

THE HIGHWAY STENOGR.

The Highway Stenog is the one I would praise
In spite of her odd and stenographic ways;
She types requisitions with requisite speed
And a wrongly spelled word is a small thing indeed
She's a typographic terror
With a telephonic tongue;
And her style is highly graphic
When it's graphically done.
She handles the keys with careless aplomb
While her pearly white teeth keep time on her gum;
She is seldom in error and never in doubt
And she works (Like the Devil) when the bosses are out.
She's a stenographic marvel
With a stylographic pen;
And she knows her subjects thoroughly
When her subjects are the Men.
She faces exams, with a confident air
For Escher or Stanton have nothing on her;
She's hard to get on with and harder without
And I like 'em all, either tall, short or pleasingly plump.
She's a paragraphic flapper
With a sophisticated air;
But if you are halfway decent
You can bet she'll do her share.

—W.K.W., Div. VI.

FROM AFRICA AND CHINA.

THE fame of California has traveled far, but it appears that construction and maintenance practices followed by the State Highway Department are attracting equal attention in distant lands. On the same day, recently, the BULLETIN received two clippings, one from *The Standard*, published in Nairobi, British East Africa, and the other from the *Shanghai Mercury*, of Shanghai, China, both quoting the State Highway Engineer of California.

The Nairobi paper republished, in full, a long article telling of the oiling of California highways to eliminate dust and reduce maintenance costs. The item in the Shanghai paper was a discussion of standards of construction.

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

Cont. No.	Division	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
COMPLETED AND ACCEPTED SINCE JAN. 24, 1927.											
496		San Luis Obispo	2	F	About 2 miles north of Santa Maria		Concrete Girder Bridge	Rocca and Caletti	\$126,832 65	April 5, 1926	
498		Imperial	26-27	A, G-C, D, A	Brawley Main Canal, Alamo River; Low Line, High Line and Trifolium Canals		Five Timber Bridges	W. M. Ledbetter and Co.	40,181 40	May 7, 1926	
507		Orange	60	A	Branagan		Undergrade Crossing	W. M. Ledbetter and Co.	18,669 04	July 14, 1926	
512		San Bernardino			San Bernardino		Division Office Building	George Herz and Co.	31,731 25	July 30, 1926	
514		Yolo	6	C	Between West Sacramento and the M Street Bridge	0.55	P. C. Concrete Pavement	Henry Brown	35,454 60	July 30, 1926	
AWARDED SINCE JANUARY 24, 1927—None.											
PENDING AWARD—None.											

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

STATE HIGHWAY MAINTENANCE FUND CONTRACTS (Including Gasoline Tax Fund)

Cont. No.	Division	County	Route	Sec.	Location	Miles	Type	Contractor	Estimated cost	Date contract awarded	Contract time, days
COMPLETED AND ACCEPTED SINCE JAN. 24, 1927.											
M-113		Shasta	3	C	Across Doney Creek		Concrete Arch Bridge	Bordwell and Zimmerman	\$86,915 63	Mar. 17, 1926	
M-145		Mariposa	18	E	Across Bear Creek 3 miles south of Briceburg		Concrete Girder Bridge	Noble Brothers	12,810 94	Sept. 14, 1926	
AWARDED SINCE JANUARY 24, 1927.											
M-158		San Joaquin	5	B	At the Mossdale Bridge	0.26	Grading	J. E. Johnston	\$32,272 99	Feb. 7, 1927	60
M-159		San Diego	2	B	At the Carlsbad Overhead Crossing	0.26	Grading and Water Bound Mac. Base	Charles E. Crowley	14,235 75	Feb. 7, 1927	75
					Sub-total	0.52			\$46,508 74		
PENDING AWARD.											
		Kern	4	D	Kern River Bridge at Bakersfield		952 lineal feet of Sidewalk		\$8,413 31		
					Total State Highway Maintenance Fund Contracts Awarded and Pending Award	0.52			\$54,922 05		

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

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