

# Arizona Highways

December 1931

No. 1

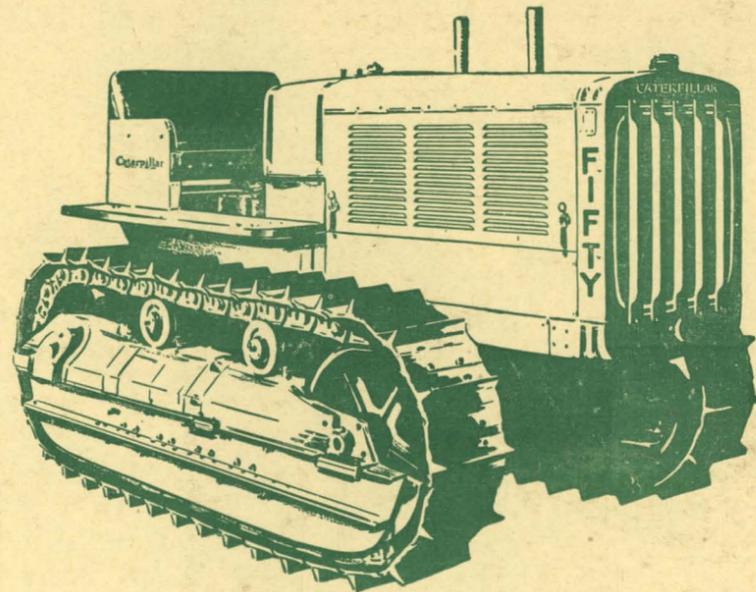


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# Arizona Highways

December, 1931

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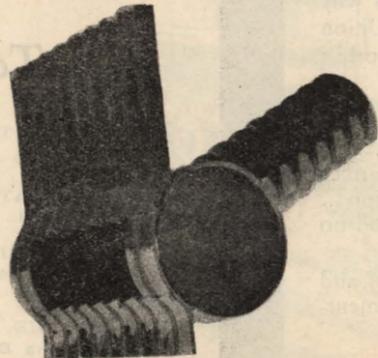
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# Embankment Protection

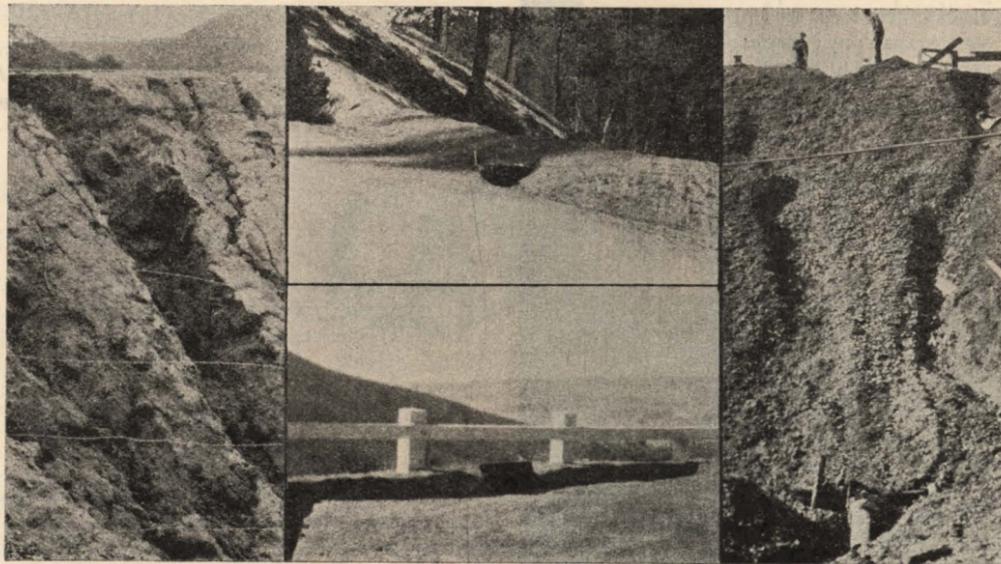
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# ARIZONA HIGHWAYS

CIVILIZATION FOLLOWS THE IMPROVED HIGHWAY

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Volume VII

DECEMBER, 1931

Number 12

## What Relocation Of Highways Means

By PERCY JONES, Jr., Chief Locating Engineer

To the layman, traveling detours and observing highway construction generally, it probably appears that there is a disproportionate amount of reconstruction of roads—roads that, not many years ago, he considered very good and which would be quite satisfactory if only the riding surface were improved. Sometimes, traveling the last road finished he may even see the signs of three constructed roads which would date approximately as of the years 1915, 1920 and 1930 each,—this not counting the original wagon track which with very few exceptions, was about the only kind of road we had in Arizona prior to 1915.

The thought may occur to him that the highway engineers are spending a great deal of money correcting their past mistakes or those of their predecessors. There are not many predecessors. Those who are working today in the higher engineering positions are, with allowance made for the increase in business and force of the Highway Department, the same men who worked in lesser positions on the first highways and the last railroads built in the state.

### Early Problem

The first problem in Arizona that confronted the highway engineer, that is, when the automobile came into general use, was to build a system of roads that one could travel 365 days in the year and to construct, with a limited amount of money, this system of highways within a limited time. To keep within the amounts budgeted for highways this compelled the engineer to locate roads with numerous curves and with a grade that, in many cases, followed closely the ground line.

Dips were constructed in lieu of bridges and seldom could a location be secured that was ideal for both structures; consequently the location favoring the dip was often adopted, owing to the lesser cost.

The locations made and the highways constructed to the standards of 1920 soon became obsolete. The speed of all classes of traffic has materially increased, together with a large increase in the num-

ber of cars using the highways, larger busses and trucks were constantly being put into service.

All this tended to make the sharper curves dangerous, the dip also a menace



A new grade opens the wonders of Oak Creek Canyon to every one. The old grade was a thriller that only the venturesome undertook.

to safe travel and, in some cases, the cause of intolerable delays during floods.

The reason stated above—the necessity of a road that could be traveled 365 days in the year, and the necessity of such a system of highways, was the subordinate to the fact that had a higher type of road been constructed it would have involved the expenditure of millions of dollars which were not available.

The above program having been completed, a higher standard of location and construction was adopted, and while the standard does not equal the location and construction in some of the states where

the amount of money available is many times that at the command of the Arizona Highway Department, the engineers feel that the road built to the present standard will not call for revised alignment for many years to come. However, the engineer would indeed be bold who would say that the future will not see a demand for even higher standards.

### Cheaper Than Detours

Minor changes, for example, offsetting a location of some road 50 feet or so, may often look to the layman as a waste of money, and that the old road could have been re-graded and widened at much less expense than building an entire new section to one side of the present center line. Most engineers cannot take any decided issue with the layman on this point, as it is only after having the figures before them at the completion of several jobs that it has dawned upon them that they were spending nearly as much on detours as would be the saving in utilizing the old road.

Furthermore, believe it or not, engineers are generally human; and criticism received when the public is compelled to travel a bad detour at last penetrates even the thickest hide.

To sum up the factors why existing roads are changed:

1st: The money has not been available to construct to the standard that the engineer deemed advisable at the time of the original construction.

2nd: Increased speed and longer busses and trucks make necessary the curves of longer radius and wider road-bed and bridges, if we are not to increase the already appalling toll of highway accidents.

3rd: Our problem is not necessarily to avoid reconstruction, and if it were our problem we would probably fail to find a satisfactory solution.

### Changes Are Progress

Those of us who have worked through the past ten years on highway location and construction have learned much as to the requirements of today as compared with the beginning of the period. We are probably better qualified to predict

the next ten years than we were the past; however, we do not know what will be required ten to twenty years in advance and it is probable we never will have this knowledge. We must bear in mind one thing—when no changes are made progress will have ceased.

With the exception of widening, which may be regarded as betterment rather than reconstruction, I do not believe there will be much reconstruction in the rough mountainous country for a considerable time to come. As a rule, the principal mountain roads are of later date than the valley roads and were built to a more satisfactory standard, and with the exception of widening and surface improvement, alignment is the only improvement to which they are susceptible. Bridges to replace dips do not occur as frequently in the mountains as they do in the valleys; bridges should have been constructed in the first place.

To improve the alignment of a mountain road materially as a rule calls for an entire re-routing—an ambitious program considering the benefits to be derived.

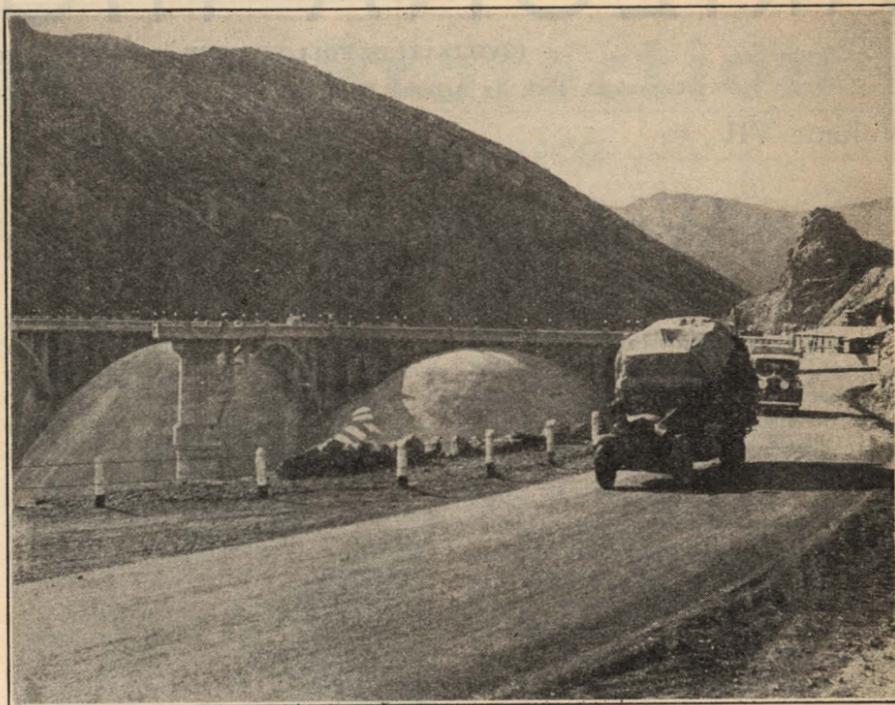
The replacing of a gravel surface with an oiled surface may cause the relocation of a valley or desert road, because the improved surface renders the elimination of dips necessary, and by that time the grading is a very small part of the cost of the job. Frequently the construction of a suitable detour amounts to more than the saving in yardage of earth work effected by using the original alignment. Therefore, except when right of way may prevent, there is often an advantage in paralleling the original road with a new one, for no other reason than to simplify the detour problem.

#### Speed Change Alignments

In the mountains grading is the big cost. Compared with it the cost of the oiled surface is small; therefore the mountain roads are generally oiled without reconstruction.

No great improvement in the ratio of grades on mountain roads has been made or is liable to be made. Our standard for maximum grade is the same as it was fifteen years ago. The tendency is to sacrifice grade for improved alignment. The old make of car could get around a curve but it had trouble on a long hill. Hills do not worst the modern car, particularly if its speed can be maintained. Curves cut speed.

Mountain roads that are being located now, or have been located within the past four or five years, are located to a materially higher standard than those



This change was necessitated by the building of Coolidge Dam, forcing an entirely new routing of Highway to Upper Gila Valley.

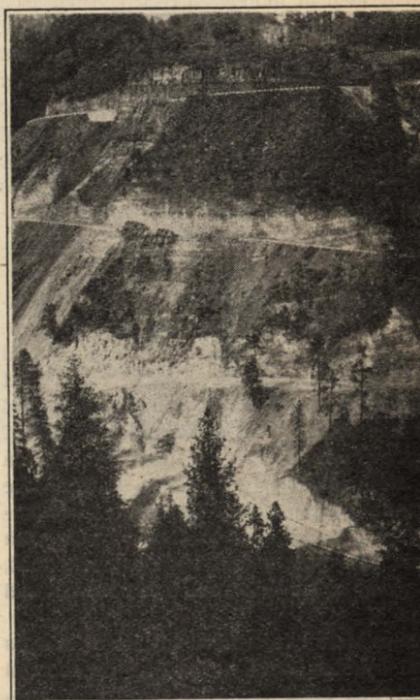
to which we have been accustomed. A 100 ft. radius was accepted for the minimum for curves on mountain roads for years; 200 to 300 ft. radius were preferred, but the cost of the road would not be materially increased to get them if the 100 ft. radius fit the country. Above a 500 ft. radius any curve was usable if there was any reason for it.

Today we locate upon a 1,000 ft. minimum radius in ordinary rough country. When it becomes very rough and utterly unreasonable to maintain the 1,000 ft. standard curves to a 500 ft. radius will be considered. The 300 ft. radius is acceptable only upon the faces of cliffs, where anything else would be in space or under the mountain. Compared with our ideas of reasonable cuts ten years ago, the 300 ft. curve is under the mountain.

We do not think the alignment of the roads as located now will be changed. It is hard to imagine straighter roads than the later ones, yet ten and even fifteen years ago we considered our locations good.

#### A DRY

Temperance Lecturer: "Now, suppose I had a pail of water and a pail of beer on this platform, and then brought on a donkey. Which of the two would he take?"



Another view of the spectacular Oak Creek Canyon grade.

Loud Voice: "He'd take the water."

Temperance Lecturer: "And why would he take the water?"

Voice: "Because he's an ass."

## Division Locates Materials For Construction Projects

By H. H. BROWN, Assistant Engineer of Materials

In recent articles appearing in this magazine, the Materials Division has attempted to give the readers some idea of the tests performed within this Laboratory, their significance, and their application to actual practice in highway construction work. It is the writer's intention to give the readers some idea of another phase of our work, which has heretofore not been touched upon. This is the work of selecting the sites from which sand and gravel, or rock for concrete and surfacing material, and mineral aggregate for oil surfacing, may be obtained.

Upon the completion of a location survey for a new highway project, a man is sent from the Materials Division onto this project to make a subgrade and materials survey. This man makes a study of the materials along the surveyed line, which will go into the surface of the completed roadway. If the cuts and fills are light, this is easy; but if they are heavy, it is very difficult. He tries to determine, approximately, without the aid of laboratory tests, what section or sections of the road will require subgrade stabilizer, in order to make a road which will care for traffic, and which will also make a good foundation for an oil mix pavement.

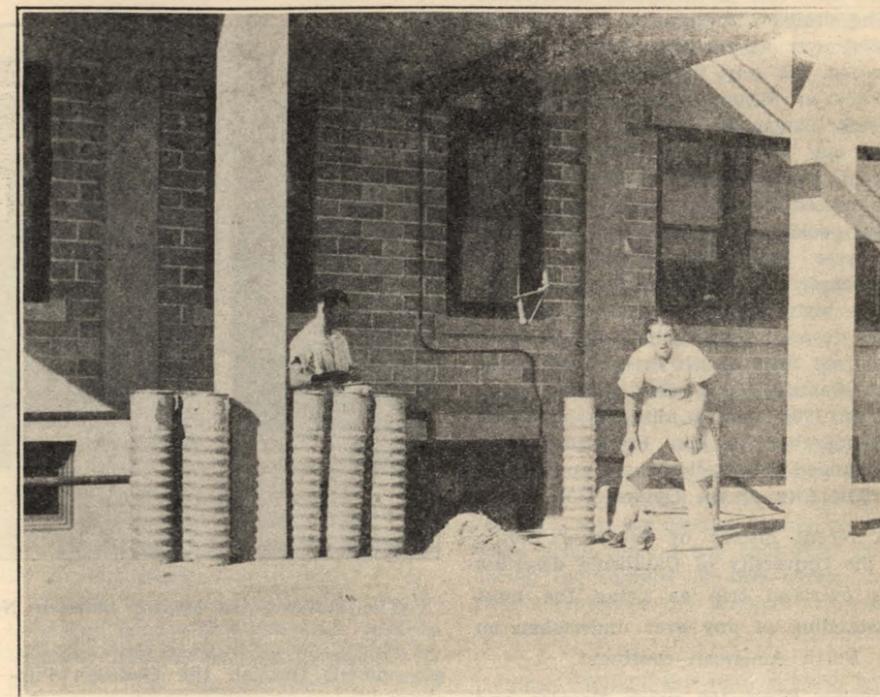
#### Study Aggregates Needed

Then, from the set of plans of the road, if they be finished, he notes the quantity of concrete required for the project and the location of the larger concrete structures. Then he determines the number and location of the subgrade stabilizer pits required to surface the project most economically, and the approximate yardage required from each pit. He also figures very roughly from the location of the bulk of the concrete yardage, where he wants to try to find sand and gravel, or rock.

If the project is going to be paved with oil surfacing in the near future, he determines the most economical pit locations for mineral aggregate and the approximate quantities required from each. With this information in mind, he starts out to see if nature has provided any of these materials within a reasonable distance from the points which he had determined were the most economical sources.

#### Need Construction Experience

In order to make a materials survey, it is essential that the man in charge



Unloading cement cores sent to the laboratory by the field forces to see if materials meet the requirements.

of the work shall have had some experience in highway construction work, so that he may know whether or not a prospective pit can be worked economically. Also, it is very essential that he shall have had some laboratory experience so that he may know when to continue working a prospect, and when to discontinue and start looking for a more desirable appearing material. When he has found a material which he thinks will conform to our specifications, and has shown by a sufficient number of prospect holes that the desired quantity can be obtained, some laboratory experience is essential in taking the sample on which the tests are to be made.

In sampling a material, it is usually taken from the surface of the ground to the bottom of the prospect hole, but oftentimes he may encounter two or three entirely different classes or types of material, of which a part may be used for subgrade stabilizer, and part may be used for mineral aggregate, and occasionally concrete material has been found in the same pit. Or it may be that part of the material cannot be used at all, and consequently, if it be on the surface, must be excluded from

the sample or samples, and classed as overburden to be removed. When he has satisfied himself of the quality and quantity of the material which he is seeking, he makes a sketch, showing, if it is possible without a survey, the location of the area from which he proposes to extract the material. This location may be shown with respect to the location survey, or with respect to section or subdivision lines. If the area is too far from the surveyed line, and no section corners are found in the vicinity, he requests that a survey be made.

The samples are submitted to this laboratory, and from the tests which are made here, (some of which have been explained in previous issues of this magazine) it is determined whether or not the material is suitable for the proposed use. If found to be satisfactory, the Plans Division of the Highway Department is given the sketch or survey, from which a tracing and blue print are made, showing the location and size of the area of land requested. This, then, is given to the Right-of-Way Division, which proceeds to obtain from the owner, the right to extract the desired material.

# Many Evidences Of Romantic Past Remain In Nogales

By G. R. MICHAELS, Secretary Nogales Chamber of Commerce

The site now occupied by Nogales was passed over as early as 1681 by Padre Kino on his way from headquarters at Dolores in Mexico to the site of the present Tumacacori Mission. This mission was founded in 1687 and work started in 1730. This same site was also passed numerous times by Spanish Crown soldiers who founded Tubac in the year 1728. Both Tubac and the Tumacacori Mission are now located on U. S. highway 89 and are 19 and 22 miles respectively, north of Nogales. It was from the Spanish Presidio at Tubac that Captain Juan Bautista de Anza left in 1784 with a military expedition and marched to San Francisco where he founded the Presido there and named it "The City of the Golden Gate."

A recent history by Professor Bolton of the University of California describes this overland trip as being the most outstanding of any ever undertaken on the North American continent.

During these 126 years Nogales and the surrounding territory was Spanish owned and it was not until 1864 that this was acquired by the United States



The Gateway to Mexico between Nogales, Arizona, and Nogales, Sonora.

government through the Gadsden Purchase.

#### Founded in 1880

In about the year 1880, a man by the name of Isaacson had a trading post

about where the Southern Pacific station is now located. The town at that time consisted of several shacks and tents enclosed by a wall of ocotillas, plastered up with mud. This storekeeper, Isaacson, wanted the town named after himself, and another man on the ground at the same time, wanted it called "Ezekiels" for himself. We certainly owe eternal gratitude to the man who suggested "Nogales"—for consider what we have escaped all these years—"Isaactown." The name "Nogales" is Spanish for walnuts, as it was under the shade of the black walnut trees in this section that the early campers pitched their tents.

A party of surveyors went through Santa Fe Railroad Company, to survey a railroad from Benson, Arizona, to a point named Moreno station, about forty miles north of Guaymas, Sonora, Mexico. With two crews working, one from the Benson end and one from Moreno station, they met at the line and completed the road in April, 1882. With the building of the road in prospect, between 1880-1882, others came to the settlement.

#### Driving Last Spike

The day the last spike was driven was a gala day for Nogales. The two engines met at the line; the one on the United States side was a big Santa Fe



The International Line as it existed in 1893, with Monument No. 26, consisting of a pile of rocks, on the front porch of the Brickwood saloon, the cigar case being in Mexico while the saloon proper was in the United States.

engine named "Thomas Nickerson." Mrs. W. R. Morley, wife of the Chief Engineer, was selected to drive the silver spike, stood with one foot on the fender of the engine in Mexico and the other foot on the fender of the engine on the American side and drove the silver spike which completed the road. This chief engineer, W. R. Morley, is the man for whom our Morley Avenue is named.

In June 1897, the President of the United States created by proclamation "in and near the town of Nogales, a public reservation of a strip of land sixty feet wide on the American side of the International Boundary Line between the United States and the Republic of Mexico." Previous to this time, the line had been surveyed and monuments set by a party of engineers sent out by our government. On our side of the line, the buildings, including the railroad station, were right to the very line and all the street was in Mexico. There was one building, the Brickwood saloon, where a person could go in a door on the American side and out another door into Mexico.

All this time the town was wide open. Three or four saloons on the west side of Morley Avenue, several on the other side, doors wide open in every way. In passing by, one could see paid artists, or whatever you please to call them, to drink, dance and gamble with the men. Occasionally there was a rather unusual shooting affair. In one of these when the smoke cleared away, there had been three killed and one wounded. It was at the Palace Saloon, about where the Border Cafe and the Popular Store are now located. Soon after this gun battle, gambling was suppressed in Nogales.

#### Now Important Part

The pictures illustrating the various changes which have taken place in Nogales show: first, the line as it existed in 1893 with monument No. 26 consisting of a pile of rocks on the front porch of the Brickwood saloon, the cigar case being in Mexico while the saloon proper was in the United States; the picture showing the line in 1894 also shows the Depot and other buildings still across the International Line as it was not until 1897 by Presidential proclamation that the International Line was cleared.

Two years ago the federal government spent some \$70,000 in making the International Line at Nogales one of the most attractive along its entire boundary. Beautiful ornamental fence with attractive gates made of native rock was built. The entire strip was paved and

## Professor Says Poor Roads Exhaust Riders As Well As Machines

The saving in human energy, brought about by good roads, is greater than the saving in car operating costs, according to an article by James R. Griffith, engineering professor at the Oregon State Agricultural college.

Using the figures in Bulletin No. 91 of the Iowa State College of Agriculture and Mechanic Arts, which show that the cost of operating the average automobile is 5.44 cents per mile, on high type (paved) roads, 6.43 cents on intermediate (gravel, macadam or bituminous treated), and 7.50 cents on low type (earth, sand-clay or light gravel). Professor Griffith says: "I note that by op-

ornamental lighting system installed and, in addition, new Spanish type garitas (inspection stations) were constructed at the Grand Avenue and Morley Avenue gates.

Nogales boasts of the friendly relations and good will which exist between this city and Mexico, as is evident by the fact that the International Line gates at this port are open 24 hours a day and anyone is privileged to cross at any time during that period. erating my automobile 11,000 miles a

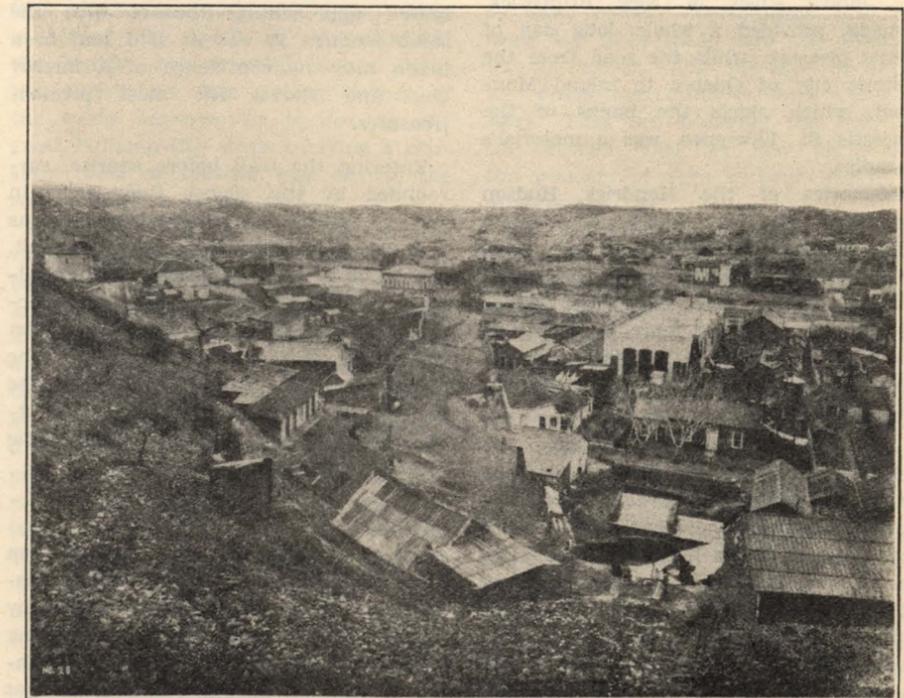
year, I will save \$108.90 by staying on high type roads in preference to intermediates. Likewise each year's operating cost will be \$226.60 less on high type roads in preference to low type. This differential, multiplied by the total number of cars operating at that mileage, would provide quite an appreciable amount which would go a long way in paying for improved roads.

"To me, as a car owner, these figures are interesting. However, I am more concerned about reading between the lines.

"Cannot the medical profession give us a measure of the energy expended per mile by the front and back seat drivers over the three types of roads? What would such a chart show? I have made some short runs over low type roads requiring more physical exertion than a hard day's work. In fact, I would estimate that 50 miles of low type road required an expenditure of energy equivalent to about 300 miles of high type road. In this connection I well remember a short run on one poor road made during the summer of 1929 which completely exhausted my physical and mental reserve."

Judge: "What's this man charged with, officer?"

Officer: "Careless walkin', yer honor. He bumped into a truck and bent both fenders and the radiator."



The International Line in 1894, showing the Depot and other buildings still across the line, as it was not until 1897 by Presidential proclamation that the International Line was cleared.

# Trail of the Ages

By BINA BOBBA

As one who has traveled over many thousand miles of highway, hearing the call of the road constantly and endeavoring always to travel with the "seeing eye" that takes in all wonders, both great and small, I am overwhelmed by the great beauty and strange scenic effects to be seen from the Arizona highway.

A few years ago, when the road appeal became too strong, I remember leaving New York City and heading northward along the coast of New England, toward Canada. It was well to be leaving the great Bagdad of America, for New York City is a replica of the particular kind of hell the careless and thoughtless motorist should be cast into for perfect punishment.

Once out of the traffic ridden trails of the metropolis, the Boston Post Road, older than our country, stretched before me like a reliable friend who urged me on with kindness and tact,—on through the green fields of Connecticut and in to the bean city without mishap.

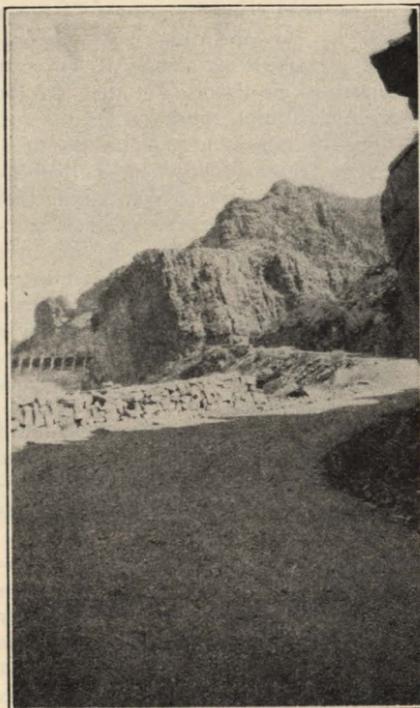
North of Boston and along the jagged coast of Maine again was the evidence of a skillful hand of a highway department. The narrow but well cared for dirt road following the banks of the St. John's River in New Brunswick, Canada, provided a whole, long day of scenic pleasure, while the road from the historic city of Quebec to inland Montreal, which skirts the banks of the majestic St. Lawrence, was a motorist's Paradise.

Memories of the Hendrick Hudson Boulevard in New Jersey, the Storm King Highway of the Palisades, the wide New York and Albany road, the speedway to Atlantic City, Lake Shore Drive in Chicago,—all give mute testimony to the work of man,—the highway men who make it all possible and pleasureable for the one behind the wheel.

## Arizona's "Scenic Ace"

But just as there is always something new and interesting around the next curve and over the next hill, so this country always has her scenic ace when the tourist thinks he has seen almost all. The Apache Trail is one of Nature's aces and Arizona plays it with a poker face; for at the end of the trail a breathless and awe-stricken tourist says: "I had no idea it was so wonderful!"

I came over the Apache Trail prepared



Apache Trail at Roosevelt Dam

for a glorious trip, but I also found myself approaching Phoenix with the same feeling. It was as if I had been taken into the confidence of a mighty One and shown His most precious treasures.

Entering the trail before sunrise, surrounded by the silence that is so in keeping with Arizona grandeur, and as the car climbs steadily to the summit, the imagination runs freely and one almost see the forms and hear the moccasin foot-fall of the men who first trod these strange canyons. Then the sun comes up, first gracing only the highest peaks with rose and later painting the road a yellowish gold with the deep canyons still in shadow.

## Peace Prevails

An atmosphere of peace prevails on every hand and only the ghost-like presence of high tension wires over my head prevents the complete forgetting that this is the highly developed country of the United States and I am not accompanying the shrouded form of Dante into strange and imaginary worlds. Now the long climb ends ab-

ruptly and the tourist, reaching the top of the summit, finds a panorama opened to his vision that is unsurpassable. After leaving the dry hills of the Globe-Miami Mining District his hungry eyes spy a silver ribbon of water in the distance. It is the Salt River!

Dawn prolongs into morning and the cheerful, reassuring sight of a red Highway Department Ford truck looms into view, carrying men to their work, giving the traveler a gay confidence which dispels the eerie feeling of former loneliness. Again and again these red cars appear like argosies of safety, and as the men greet the stranger in passing their presence seems to say, "We are on the job. Go ahead!"

The trail twists and turns. It cavorts around mountainsides and delves into valleys. It carries the tourist up to incredible heights and amazing views and into canyons that were bottomless from above. The appearance of a Gila Monster in the road just ahead may force the tourist to swerve his car, as it did in my case; but pass the Monster by, for he is the fairy tale dragon who guards the wonders within.

The wonders of the trail continue. Up to the left appears the historic Tonto Cliff Dwellings, strange sentinels of a departed race and a silent reminder that we are all travelers on the road of life. Here in all our glory today and relegated to a dusty past tomorrow,—our pride and pretensions falling from us like worn garments and only our worth remaining for a critical posterity.

## Roosevelt Dam

As a contrast to the cliff dwellings we come upon the tiny town of Roosevelt on the banks of Roosevelt Lake, with its gas stations, stores and post-office, and the tourist is quickly carried out of the past and into the present, which climaxes in the magnificent modern structure, the Roosevelt Dam! Here man looked upon the water of the Salt River and "saw that it was good" and, determining to harness, use and re-use every precious drop, has performed one of the most remarkable feats of engineering in the history of the United States. Behind colossal walls of stone the water is stored, turned into power and almost reluctantly released to its mission of prosperity in the fertile valley far below.

Down a steep grade from the dam and

again into canyons of volcanic formation, we wonder if it was just yesterday that the brittle, fire-scarred rocks ceased smoking.

Now the high sun exposes many forms of life, where all seemed so lifeless before. Here and there the inky spot of a tarantula appears to deliver a menacing message. Tiny and foolish baby rabbits dart out suddenly to risk their lives in a dash across the roadbed. A covey of quail flutter together at our passing, their small plumlets puckering with excitement and the picturesque names of Pinto Creek, Ash Creek and Fish Creek appear, exposing innocent looking stream beds that will become raging torrents when the Rain Gods will it. In these very creek beds, if the observant tourist will investigate at early morning, can be found the obvious signs and tracks of the soft-eyed deer and the slinking wildcat.

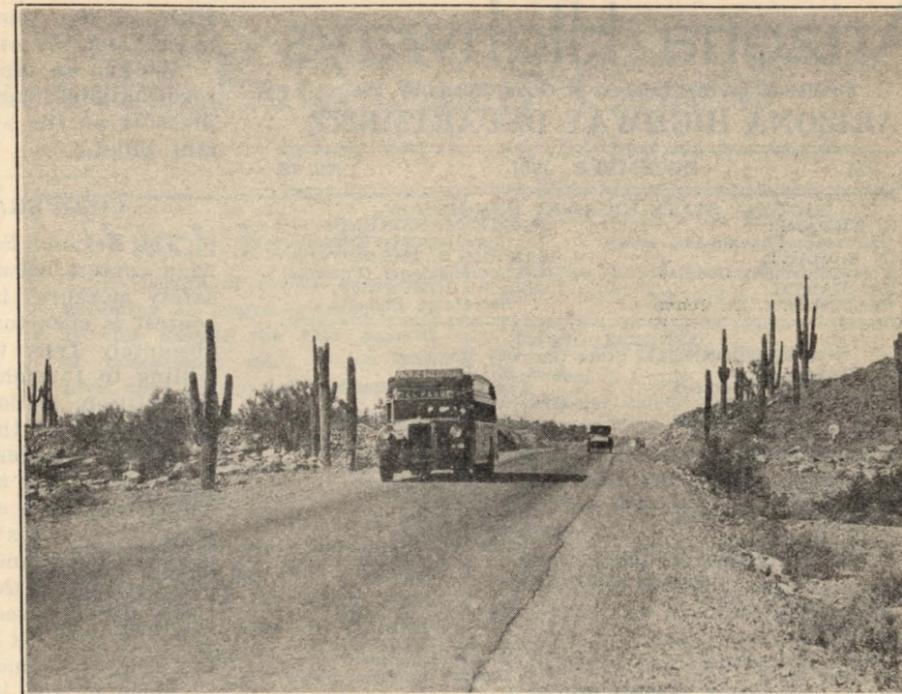
## Winding Up Fish Creek

As we near Fish Creek a Highway Department tent camp, empty of its occupants, who are now at work on the trail, gives the peaceful appearance of a deserted village, and the long, imposing climb up Fish Creek Hill begins. High up above us are the worn paths of two cascades, to remind the tourist that the Arizona rain will bring beauty as well as damage to the Apache Trail.

Upward and upward, the car travels, rounding the graceful curve of the mountain, with sharp, perpendicular walls on one side and the hazy left-behind trail far below; and then suddenly, descending upon us like a bird from the sky, we meet a silver car and the Highway Department ensign gleams like a shield in the sun. Pleasant as this sight is in daylight one can readily imagine how welcome this silver courier is at night, when storms have torn and mutilated the trail and the night patrol rides out on missions of mercy and aid.

Now, the Indian Head sign informs us that we are approaching one of the most spectacular sights of the trail,— "Walls of Bronze,"—those magnificent glimmering cliffs that are so awe-inspiring in their gigantic beauty. We have already passed the world's largest giant cactus, standing like the mammoth hand of a monster.

Stopping for gas at Tortilla Flats the traveler meets Flossie, a native brown bear, and hears the snarls of two beautiful wildcat. A rattler does not leave his feast of eggs to say "howdy" and a wild boar looks his scorn upon man and his trappings. It is a perfect interlude in this remarkable trip.



Example of new location improving commercial conditions is this new strip of road east of Apache Junction.

## A Bit of New England

Arriving at Canyon Lake we are treated to a bit of New England in an Arizona stage setting. Summer cottages and small white boats grace the scene. A homelike ease prevails, but we are soon out again in the rugged surroundings of the trail and the placid scene is behind us. About at this point, if the tourist has traveled slowly, with the observation this strange corner of the world deserves, he is met by the great Pullman-like stage, carrying a constant flow of tourists who devour the scenic wonders of the west.

A strange prehistoric atmosphere prevails. The peculiar sharp cliffs in the background are called "Weaver's Needle" and they are appropriately named, for it is to tattered Time alone that they are useful. We seem to have stepped back into the ages. One would not be at all surprised to see a lumbering dinosaur block his path and when a great truck of the Highway Department appears, illusion is enhanced. The truck appears to be at home on this trail of time; and slowly, but faithfully it pulls a grader, conditioning a road mutilated by the ravages of rain, the tramping of stock and the steady tread of automobiles bearing license plates from every state in the Union.

## Meet Betterment Crew

We are again surrounded by busy highway men and a great steam-shovel

gnaws into the mountain side. A busy caterpillar tugs at enormous boulders and swift moving trucks hurry to and fro. This modern machinery appears strangely out of place upon the time worn trail, and yet the traveler is reminded that it is only since the advent of these modern mechanisms that the route has been made safe and pleasant for the driver. This bee-hive of activity which surrounds us tells its own story. They are widening the trail for the traveler, that we may delve into the wonders of ages without hazard or unnecessary risk.

As the steam-shovel moves its ponderous body from our path and we wave good-bye to the men, I am keenly aware of the debt we owe to the state and to the workers who bridge every obstacle and achieve the impossible, in order that the searching mind and the inquiring eye may have at their disposal isolated mountains and canyons that otherwise would be sealed forever and lost from our sight.

Now, with the impressive view of Superstition Mountain, standing like the last and trusty sentinel, the mood of the trail changes. Almost like the effort of an aging beauty to rejuvenate and modernize herself, even at the expense of her distinction, we find the signs of giving way and a gradual acceptance of mundane and familiar

(Continued on Page 11)

# Arizona Highways

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## CONGRESS IS ON THE SPOT

The eyes of the six, seven or eight million unemployed, whatever number you care to guess, are looking to congress and the administration at this moment for some solution for their unfortunate plight. These men do not want a dole. They do not want the government to give them anything. All they are asking is for the creation of work through which they can support themselves and their families. It does not require the naming of any commissions. They do not have to subsidize the bankers or industry.

The use of road building for unemployment relief was tested during the past year and it has been found most effective in putting men to work promptly. More than a million men were employed directly on road and street work, and two million other men were kept busy furnishing supplies, materials and equipment to workers. Road building for unemployment relief has a tremendous advantage in that it brings the job to the worker—it is the most widely distributed activity in the country.

Roads and streets can be bought at a bargain now and the low cost tends to offset the interest charges. The increment in national wealth due to good roads will remain long after the depression is forgotten.

"The need for highways is apparent to every man who drives a motor vehicle," states the head of a Washington news service in close touch with national opinion, "and it will be difficult to convince a man who gets in a traffic jam every Sunday that there are anything like enough roads. More than one-

fifth of the country's population owns motor vehicles, and the other four-fifths drive with them."

We had an experimental sample last spring of how road building can relieve the unemployment. Congress is on the spot. It must give the nation some real relief.

## CO-OPERATING IN SAFETY WORK

The National Safety Council has launched a nationwide contest between the cities for the promotion of safety measures in their incorporated districts. This contest is open to all cities of 10,000 and over and is absolutely free, the National Safety Council being willing to furnish everything for the conduct of the competition, to do all the compiling of the statistics and furnish all the necessary forms.

Of the staggering losses sustained in the United States each year through automobile and traffic accidents, the cities of the nation contribute the largest percentage. This is natural that they should, as the greatest travel and congestion exists in the city. However, offsetting this great increase in congestion, the cities are supposed to have the best traffic regulation and the greatest enforcement of traffic laws. Yet the death toll mounts.

Some of the best authorities now argue that we do not need more laws for the regulation of traffic, but a greater understanding and enforcement of the ones we have. What the meat of the coconut is, the National Safety Council wants to find out and one of the best means of arriving at a conclusion is to amass all the data, figures and statistics they can get on the accidents that are occurring and see what causes them. This is the object of the contest between the cities of the land.

If every city will co-operate with the Safety Council enough statistics may be gotten together to conclusively point out what is the outstanding reason for our increasing traffic crashes. It is like the scientists searching for the germ of a disease. Once the germ is isolated, its carrier discovered, then it is a comparatively easy problem to stamp out or control the disease.

Our automobiles are killing and injuring more persons in the United States each year than any disease. It is time we found a cure.

## IT'S AN OLD STORY

Parking problems are not new. London had one as far back as 1660, according to an order issued in that year by Charles II, which reads as follows:

"Whereas the excessive number of hackney coaches in the city of London are found to be a common nuisance, the streets and highways being thereby made impassable and dangerous;

"We command that no person or persons permit or suffer said coaches to stand or remain in any of the streets.

"Given at our court at Whitehall the eighteenth day of October, 1660."

The curfew tolls the knell of parting day

A line of cars wind slowly o'er the lea,  
A pedestrian plods his absent-minded way  
And leaves the world unexpectedly.

# Cities Asked To Enter Safety Contest

A nation-wide, National Traffic Safety Contest, will be launched on January 1st, 1932, to cope with that Moloch of modern civilization, the highway slaughter and grade-crossing shambles of motordom.

Yearly the shameful toll increases with a total in 1931 which threatens to approach 35,000. For years the daily press has quoted the comparative death rates and sounded warning, not only against the moron who strives to crowd the locomotive from its chosen place and the drunken or reckless driver, but to impress upon all drivers of motor vehicles the necessity of a strict observance of traffic laws.

A determined fight will be waged to arouse in every corner of the United States a great public uprising against the public apathy which now hinders preventive efforts against the senseless slaughter of the past few years. Such is the object of the National Traffic Safety Contest. Those now striving, in the face of public indifference, to work a reform in this appalling condition of affairs, need the support that this contest will give them. The public officials and civic organizations that are making their communities safer deserve the highest commendation and recognition throughout the country.

The purpose of the contest, in which every city, town and hamlet in the country is earnestly urged to participate, is to bring recognition to municipalities for such constructive achievements as they may attain in overcoming their traffic accident problems.

The terms of the contest, which of course are worked out by committees of experts, recognize two kinds of safety accomplishment:

First, either a lowering of the death rate over previous years, or, the lowest death rate of competing municipalities.

Second, the enactment and enforcement of traffic regulations and the conduct of educational activities, which, according to experience, are bound to result in a lower accident toll. Awards will be made for the "safest city" in each group, for the best in all groups and for the state making the best aggregate showing.

## Open To All Cities

The contest is open to cities of all sizes, nor will the small town be judged by the same standard as that of its metropolitan neighbor. The winner of

important national organization interested in public welfare has been pledged.

## Enter Before January

Entries should be received before January 1, 1932, but will be accepted up to February 1. Entries after February 1 will be by special arrangement, as in the cases of a new administration or new community safety organization.

To enter the contest each city will sign an entry blank, which, together with report forms and sets of helpful instructions, are furnished on request by the Council.

These entry blanks should be signed by the mayor, city manager or village president and immediately returned to the National Safety Council. In April and October, 1932, the city will be asked to submit certain information regarding its traffic and safety activities, on forms provided, and at the end of the year will be asked for a brief report covering all the scheduled items. There is no charge for participation in the contest. The awards will be made at an appropriate time and place in the spring of 1933.

## Watch For This

The hazard of carbon monoxide poisoning in closed garages is growing despite the vast amount of educational work which has been done in the hope of eliminating this type of accident, according to the Automobile Club of Southern California. The casualty list trebled from 1924 to 1929.

A majority of deaths from this cause occur in the early days of winter—during the first prolonged cold spells. As the winter wears on, motorists seem to be more careful to keep the garage doors and windows open when running their motors. It is unfortunate that several hundred lives must be sacrificed each year before the lesson is sufficiently impressed on other car owners.

These things are to be remembered about carbon monoxide: You cannot see it, cannot smell it, nor can you taste it. The unseen foe can only be battled with plenty of fresh air.

## Trail of the Ages

(Continued from page 9)

things. The mountains become smaller, as if to hide their identity and trees become more numerous. A prim, well cared for highway maintenance house, with a red roof, marks the end of things strange and supernatural. The trail drifts into a wide, level thoroughfare, fellow travelers become more numerous. The Old Salt no longer maintains the dignity of a river, but its water appears in irrigation canals on all sides. Citrus trees spread out in great groves and pink, luscious dates hang from the roadside vendors. The force of production and prosperity is all around us for we have reached the famous Salt River Valley of Maricopa County. The Trail of the Ages has lead us to a modern Utopia.

## BRIDGE IS MENTIONED

Elimination of two grade crossings and sharp curves by the construction of one bridge west of Seligman is praised by the Engineering News Record of October 22. The comment is accompanied by a picture of the bridge.

the grand prize will be that city which, in the judgment of the Committee of Judges, has brought about in the interest of safety, those reforms which are practicable for a city of its size.

To bring about a keener competition the cities are divided into seven population groups, as follows, with awards in each group:

Over 500,000.  
250,000 to 500,000.  
100,000 to 250,000.  
50,000 to 100,000.  
25,000 to 50,000.  
Under 25,000.

The last group will be further divided, if necessary.

To insure the most competent and impartial decisions all awards will be made by a committee of nationally recognized experts headed by Dr. Miller McClintock, Director, and Albert Russel Erskine, Bureau for State Traffic Research, Harvard University.

While the sponsorship and promotional machinery of the National Safety Council will guide this all-inclusive contest-campaign, the cooperation of nearly every

# Commission Requests C.P.A. Statement

The Arizona State Highway Commission met at the call of the Chairman in their offices in the Highway Building November 23, 1931, at 10:10 A. M. Those present were Chairman Addams, Vice-Chairman Hart, Commissioners Mansfield and Trengove, also State Engineer, Secretary and Attorney Salmon. Commissioner Barth was absent.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and carried, that the official minutes of November 3 and 4, 1931, be approved.

Chairman Addams asked Vice-Chairman Hart to take the chair and stated he would like to have the opinion of the Commissioners on the question as to whether or not all the statements filed by the contractors should be made a matter of public record. Attorney Salmon was asked if there was anything in the law prohibiting their being a public record. Attorney Salmon stated their statements were filed with the Department and if anybody wanted to come to the Department and look at them, it was alright. Chairman Addams resumed the chair, and stated he would entertain a motion.

Commissioner Mansfield stated he believed this was a departmental matter. Chairman Addams stated he believed the Highway Engineer should be instructed in the matter. Chairman Addams asked Vice-Chairman Hart to take the chair. It was regularly moved by Commissioner Addams, seconded by Commissioner Trengove and carried, that the State Engineer be instructed in case anybody wanted to see the statements of any contractors, they be permitted to do so. Commissioner Mansfield not voting.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that the Commission recess at 12:15 P. M., to reconvene at 2:00 P. M.

The Commission reconvened at 2:20 P. M., all members present except Commissioner Barth.

Commissioner Mansfield stated he thought the Department should notify all contractors, who are now bidding in the State of Arizona, that after the first of January their pre-qualified statements will have to be checked by a certified public accountant. Chairman Addams asked Vice-Chairman Hart to take the chair and moved that every-

thing stand as it is until such time as every contractor is notified that after the first of the year all contractors will file statements signed by a certified public accountant. The motion was seconded by Commissioner Mansfield and unanimously carried.

Vice-Chairman Hart stated he believed these statements should be renewed quarterly. It was regularly moved by Commissioner Addams, seconded by Commissioner Mansfield and unanimously carried, that all contractors' statements must be renewed quarterly. Chairman Addams resumed the chair.

The Secretary read a communication from Steffgen Brothers requesting permission to sue F. E. Stearnman and his bondsmen in the name of the State. Attorney General stated he thought the request was proper. It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that the resolution granting permission to Steffgen Brothers to sue F. E. Stearnman and his bondsmen in the name of the State to be adopted.

A resolution was presented by the Secretary in which the Phoenix Rubber Company requested permission to sue the Western Gunite Company and their bondsmen in the name of the State. Commissioner Mansfield raised the point that inasmuch as final payment had not been made this contractor, it was unnecessary to bring suit. It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that the request of the Phoenix Rubber Company be denied.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that the resolution establishing the location or relocation and specific designation of the Benson-Vail Highway designated as Federal Aid Project 18-E, 1 Rec., be adopted.

Chairman Addams turned the chair over to Vice-Chairman Hart. It was regularly moved by Commissioner Mansfield, seconded by Commissioner Trengove and carried, that the resolution abandoning that portion of the highway eliminated by the grade crossing separation designated as Federal Aid Project 94, Sections B, C, and D, be adopted.

The Secretary read a letter from Ed. Oglesby, Maricopa County Assessor, asking instructions on the issuing of license

plates on trucks. The State Engineer stated Mr. Oglesby would like to appear before the Commission and talk it over. Chairman Addams resumed the chair and instructed the State Engineer to invite Mr. Oglesby to appear before the Commission.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Trengove and carried, that the resolution concerning the location or relocation of the highway designated as Federal Aid Project 94, Section F and G, of the Florence-Tucson Highway, be approved.

Mr. Oglesby, Maricopa County Assessor, appeared before the Commission, and stated he was willing to abide by any instructions from the Motor Vehicle Department concerning the issuance of plates, and advised the Commission that something should be done before the County Assessors held their meeting in Yuma, December 1, 1931, so that the Assessors throughout the State would have something on which to base their actions. Action was deferred until Attorney Salmon had an opportunity to confer with the Governor.

It was regularly moved by Commissioner Hart, seconded by Commissioner Trengove and carried, that the resolution transferring \$12,981.79 from Budget Item 71 to A. F. E. 32, be adopted.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that the resolution transferring \$21,101.05 from completed or abandoned projects to projects itemized in the resolution, be adopted.

A communication was read from the Greenlee County Taxpayers' Association asking for certain information pertaining to Highway U. S. 60. The Secretary was instructed to write the Greenlee County Taxpayers' Association answering the questions asked with information furnished by the State Engineer.

The Secretary read a letter from L. V. Root, Secretary of the Celebration Committee, inviting the Commission to attend the celebration of the opening of the Kingman-Hoover Dam Highway on Thursday, December 3, 1931. The Secretary was instructed to write the committee the Commissioners would be unable to attend.

The Secretary read a letter presented by Mr. Whitworth from the County Oil

Company requesting an extension of time for filing a motor fuel distributor's bond. Mr. Whitworth advised the Commission that he had prepared General Orders No. 16-A, which was designed to supersede General Orders No. 16, previously authorized by the Commission for the bonding of motor fuel distributors. The Secretary read the General Orders No. 16-A.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that resolution designated 16 be substituted by resolution just read, known as General Orders No. 16-A.

The Secretary read a letter regarding the issuing of a tent to the Hope Missionary Home. It was regularly moved by Commissioner Trengove, seconded by Commissioner Hart and unanimously carried, that a tent be loaned to the Hope Missionary Home.

The Secretary called to the attention of the Commission that the County of Maricopa asked for the loan of a tent for a period of 60 days and they were loaned a 12 x 14 tent. It was regularly moved by Commissioner Mansfield, seconded by Commissioners Hart and Trengove and carried, the tent be loaned to the County of Maricopa as requested.

A communication was read from B. W. Norton, City of Bisbee, requesting the Department to sell one of the old F. W. D. trucks with body and hoist to the City of Bisbee. It was regularly moved by Commissioner Hart, seconded by Commissioner Mansfield and unanimously carried, that the Highway Department sell an F. W. D. truck, No. X-64, with body and hoist to the City of Bisbee for \$25.00.

The Secretary read an opinion from the Attorney General concerning an accident of Harold A. Beard, advising the Commission that the Highway Department was not liable for any accidents on the highways and the Commission was without authority to hear or settle any claims for damages. It was regularly moved by Commissioner Hart, seconded by Commissioner Mansfield and unanimously carried, that the claim of Harold A. Beard be disallowed.

It was regularly moved by Commissioner Hart, seconded by Commissioner Mansfield and unanimously carried, that the Commission adjourn at 5:10 P. M., November 23, 1931, to reconvene at 8:30 A. M., November 24, 1931.

## MEETING ON NOVEMBER 24

The Commission reconvened at 8:30

## BROTHERHOOD OF RAILROAD TRAINMEN

Winslow Lodge No. 477

Winslow, Arizona,  
December 6, 1931.

Honorable G. W. P. Hunt,  
Phoenix, Arizona.

Dear Sir:

I have been instructed by the above named lodge to write you under lodge seal commending the work of Mr. Chas. Osborn, patrol officer of the highway department and send copies to Mr. Addams, Mr. Hall and Mr. Osborn. Mr. Osborn has by his good work nearly put off the road all drivers that are a hazard to the people. And at the same time been courteous to the innocent violator of the law.

This brotherhood stands for law and order and are always ready to notice public officials that perform their duties honestly.

Yours very truly,

(Signed): V. F. FOY,

V. F. Foy, Secretary 447, B. of R. T.

cc-Mr. Addams,

Hall,

Osborn

Secretary files 477

A. M., November 24, 1931, all members present except Commissioner Barth who was absent.

The Secretary read a letter from the Association of Standardization of Highway Materials urging the Department to have a representative at the national meeting to be held in Washington, December 8, 1931. The State Engineer recommended that J. W. Powers be sent to the meeting. It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that Mr. Powers be sent to the convention.

The Secretary read a petition presented by Lucy R. Stevens signed by residents of Patagonia and vicinity, requesting the State to construct a fence along one side of the highway from the Richardson Estate to the Chiricahua Cattle Company fence in Casa Blanca Canyon, a distance of about three and three-tenths miles. It was regularly moved by Commissioner Hart, seconded by Commissioner Mansfield and unanimously carried, that the petition be referred to the State Engineer.

Letters were read concerning U. S. Highway 60 received from Mr. James

Peterson, State Senator Thomas Collins, G. L. McClane, Franklin D. Lane, Holbrook Chamber of Commerce and the Holbrook Lions Club. Chairman Addams asked Vice-Chairman Hart to take the chair and it was regularly moved by Commissioner Addams, seconded by Commissioner Mansfield and unanimously carried the communications be filed and copies be made for all the Commissioners.

A communication was read from W. R. Eccles, State Highway Engineer, State of New Mexico, concerning the placing of a joint marker on the New Mexico-Arizona State Line for the Jefferson Davis National Highway. Chairman Addams asked Vice-Chairman Hart to take the chair. It was regularly moved by Commissioner Addams, seconded by Commissioner Mansfield and unanimously carried, that the Secretary be instructed to write the Commission had gone on record that no signs be placed on the State's right of way and if it is their desire to have a marker placed, they can do so but it cannot be placed on the State's right of way.

It was regularly moved by Commissioner Hart, seconded by Commissioner Trengove and carried, that an opinion be requested of the Attorney General as to whether the Department could pension Stephen Freeman in the amount of \$50.00 a month.

The Secretary read a plan submitted by E. V. Miller for the formation of a state-wide safety organization. Mr. Miller explained to the Commission what he accomplished in his trip East to a meeting of the safety council and stated the plan, which he submitted, was based upon the information he gained at that meeting. Commissioner Mansfield stated he thought the idea was a good one except that the Highway Commission would be looked upon as Godfather of all funds; that the Department should concern itself alone in the big problem of road safety. After considerable discussion, Mr. Miller was instructed to send every member of the Commission a copy of the plan and to formulate a plan for the Highway Department, to be submitted at the next meetin.

The Secretary read a letter regarding a lengthy report on tax evasion. The Commission requested the Motor Vehicle Department to furnish each member of the Commission with a copy of the report.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried,

A. M. November 24, 1931, to reconvene at 10:00 A. M., December 9, 1931.

#### MEETING HELD NOVEMBER 3

The Arizona State Highway Commission, Addams, met in special session on November 3, 1931, at 10:10 A. M., in their offices in the Highway Building. Those present were Chairman Addams, Vice-Chairman Hart, Commissioners Barth, Mansfield and Trengove, also Attorney Salmon, State Engineer and Secretary.

It was regularly moved by Commissioner Barth, seconded by Commissioner Hart and unanimously carried, that the official minutes of October 5 and 6, 1931, be approved.

Mr. Barnett Marks, Attorney for the Phoenix Firestone Company, appeared before the Commission concerning a request to file suit in the name of the State against Heitsch and Bitten, highway contractors, and their bondsmen. The same request had been refused by the Commission at their October meeting. After Mr. Marks had placed the claim of the Phoenix Firestone Company before the Commission, Commissioner Mansfield asked Mr. Marks if either he or his client could positively state the tires in question had been actually put into service and consumed by the contractor in the construction of that project. Neither Mr. Marks or Mr. Hudson of the Phoenix Firestone Company, could positively state such was the case and agreed to furnish the Commission with definite information at their next meeting.

The next order of business was the awarding of contract on the Florence-Tucson Highway, F. A. P. 94-D and F. A. P. 94-C. It was regularly moved by Commissioner Barth, seconded by Commissioner Hart, and carried, Commissioner Mansfield voting "No," that the bids on the Florence-Tucson Highway, F. A. P. 94-D and 94-C be rejected and the work be readvertised immediately.

Awarding of contract on Florence-Tucson Highway, F. A. P. No. 90-A and 18-A, Reo. The State Engineer recommended the contract on the Florence-Tucson Highway, F. A. P. No. 90-A and 18-A Reo., be awarded to the low bidder, Skeels and Graham Company, Tucson, Arizona, stating they had qualified and were responsible bidders. It was regularly moved by Commissioner Barth, seconded by Commissioner Trengove and unanimously carried, that the contract on the Florence-Tucson Highway, F. A. P. No. 90-A and 18-A Reo., be awarded to the low bidder, Skeels and Graham Company, Tucson, Arizona, in the amount

of \$10,729.68, which does not include 10% for engineering and contingencies, provided, said contractor meets all requirements including the employment of local Arizona citizens, pays a minimum wage of \$4.00 per day for laborers, furnishes good and sufficient bond.

State Engineer O'Connell stated the Engineer's estimate was \$59,939.25 and that Pearson, Dickerson and J. C. Morse had submitted the low bid of \$49,620.25 on the Topock-Kingman Highway, A. E. F. No. 6619; he recommended the low bidder be awarded the contract. Chairman Addams inquired if this construction firm had ever done any business with the state before. Mr. O'Connell stated, "Not with the State Highway Department but with the Bureau of Public Roads." Commissioner Mansfield examined the financial statement and State Engineer O'Connell stated he was satisfied with their statements.

It was regularly moved by Commissioner Barth, seconded by Commissioner Mansfield and unanimously carried, the recommendation of the State Engineer be approved and the contract on the Topock-Kingman Highway, A. E. F. No. 6619, be awarded to the low bidder Pearson, Dickerson and J. C. Morse, Riverside, Calif., in the amount of \$49,620.25, which does not include 10% for engineering and contingencies.

Mr. Ove E. Overson appeared before the Commission asking permission for his client, Tony Yurcic, to sue in the name of the State the Ben Pearce Construction Company and their bondsmen for material and labor furnished them in the construction of Federal Aid Project No. 85-A. Mr. Hatcher stated this contract had been finished by the bonding company; that the bonding company disputed this claim and the only determination probably would be in the courts. Attorney Salmon suggested that, inasmuch as all these suits had been maintained in the name of the State of Arizona, he would like to suggest that hereafter these resolutions be sent and filed with the Attorney General so as they would have a record. He stated he could see no objection to this suit. It was regularly moved by Commissioner Barth, seconded by Commissioner Hart and unanimously carried that the resolution giving permission to Tony Yurcic to sue, in the name of the State, the Ben Pearce Constructing Company and their bondsmen be approved.

The Secretary stated that on the call for bids on one obsolete FWD dump truck made by the State Engineer on October 22, no bids had been received.

Harold Beard appeared at 10:40 A. M.

Chairman Addams asked Mr. Beard to state his business. Mr. Beard stated he had had an accident with a highway truck on October 13th. Chairman Addams requested Attorney Salmon, who had a copy of the accident report, to do the questioning of Mr. Beard. After considerable questioning, it was agreed by Mr. Beard and Mr. Salmon, at the suggestion of Chairman Addams, the Attorney General would fully investigate the complaint of Mr. Beard and report his recommendation at the next Commission meeting.

The Secretary read a resolution presented by the State Engineer authorizing C. C. Small, Deputy State Highway Engineer, M. C. Hankins, Chief Accountant, and H. C. Hatcher, Statistical Engineer, to verify and approve claims presented for payment out of the highway fund, further, approving the acts of said persons prior to this date. Mr. Mansfield asked the Attorney General what the meaning of the last clause was. Attorney Salmon stated he had presented this resolution to the State Auditor and that was her request. State Engineer O'Connell stated that meant the approval of all the claims for the last four years. Commissioner Mansfield stated he did not wish to put himself in that position. Chairman Addams asked Vice-Chairman Hart to take the chair and moved the State Auditor be contacted and invited to appear before the Commission concerning this resolution. The motion was seconded by Commissioner Trengove and unanimously carried.

The Secretary brought to the attention of the Commission unfinished business concerning an inventory of stock in the warehouse and stockroom. Chairman Addams asked Vice-Chairman Hart to take the chair and moved the request for an inventory be held over until the first of the year when an inventory is taken, so as not to handicap the Department. The motion was seconded by Commissioner Barth and unanimously carried. Chairman Addams resumed the chair.

The Secretary brought up the question of right of way on East Van Buren Street improvement. State Engineer O'Connell stated, "I turned the matter over to District Engineer Perkins and he said he would have a crew down for widening and grading between the junction and the Tempe Bridge in about a month's time. The right of way is status quo. His instructions are from me, until he gets this right of way not to do any widening or grading." Chairman Addams asked Vice-Chairman Hart to take the chair and moved the East Van Buren

Street Association be notified to this effect, as stated by Mr. O'Connell. The motion was seconded by Commissioner Barth and unanimously carried. Chairman Addams resumed the chair.

Commissioner Trengove asked how the price for printing the budget compared with the other papers. The Secretary stated they had charged for 80 inches more than the Commission had allowed, it having been decided to allow 470 inches at the price of 75 cents an inch. The Prescott Courier and Winslow Mail had complained about the reduction and their claim amounting to \$37.50 had later been allowed by the Commission. Commissioner Trengove asked if we had paid the Mohave County Miner as much as the other two papers. The Secretary stated no, that the Commission had ratified their claim for \$37.50 additional. Commissioner Mansfield asked what it was they were asking. The Secretary stated \$71.25. Commissioner Trengove asked what that amount brought their claim to. The Secretary stated a total of \$393.75 and that the total claim of the Mohave County Miner was \$420.00. Commissioner Trengove stated he believed they should be paid the same as the rest of them and they shouldn't get more than the others. Commissioner Barth stated the total claim amounted to

\$27.00 more and he made a motion the Mohave County Miner be allowed the same amount as the Prescott Courier received. The motion was seconded by Commissioner Mansfield and unanimously carried.

Mrs. Ana Frohmiller, State Auditor, appeared before the Commission as requested and stated that according to law, it was necessary for the Commission to give their approval to those officers of the Highway Department to verify and approve claims for payment out of the highway fund; that the present Commission had not given this approval and the last clause of the resolution was to validate claims which their office had passed before detecting that the Commission had never given these officers authority. Chairman Addams stated the Commission did not want to approve any action of the old Commission. Mr. Salmon stated the resolution would have to be changed and, after having made the corrections, it was regularly moved by Commissioner Hart, seconded by Commissioner Mansfield and unanimously carried, that the corrected resolution be approved.

The Secretary read a petition, which had been filed by C. L. Giragi, of Winslow, accompanied by similar copies of petitions signed by residents of King-

man, Williams, Holbrook, Ash Fork and Flagstaff, the petitions urged the routing of Highway U. S. 60 via Concho. It was regularly moved by Commissioner Barth, seconded by Commissioner Trengove and unanimously carried, that the petitions be accepted and filed.

A communication was read from E. M. Whitworth, Motor Vehicle Superintendent, setting up the estimate of bond required for motor vehicle fuel distributors in the State of Arizona, noting that he used a minimum bond of \$1,000, a maximum bond of \$100,000 and stating it was his opinion a \$1,000 bond was too small. Commissioner Mansfield lead the discussion as to the necessity of protecting the State in the collection of gas tax by distribution and stated he believed there should be no bond under \$5,000, showing it would be an easy matter for any distributor to jump his gas sales during any 45 day period to that amount by cutting prices on gasoline. He stated he did not think \$5,000 would be a hardship on anybody in the gas distributing business. Commissioner Mansfield made the motion that the minimum bond for motor fuel distributors be made \$5,000. Commissioner Barth stated he believed it should be put on a sliding scale, as there are a lot of small fellows not doing business sufficient to



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warrant that large a bond. Chairman Addams asked Mr. Whitworth for his recommendation. Mr. Whitworth said he thought \$5,000 would be out of order for many small distributors distributed fuel for the accommodation of people in their district, that he would say not less than \$1,000. Commissioner Mansfield stated he did not think it good business to encourage crooks to come into the State, and that is what is done with a \$1,000 bond. Commissioner Mansfield motioned the minimum bond be set at \$5,000; it was seconded by Commissioner Hart, and carried, Commissioner Addams voting "No."

Chairman Addams asked what about the maximum. Commissioner Mansfield stated he believed if the Department followed out the schedule it would not exceed \$100,000, and made the motion that \$100,000 be the maximum bond for motor vehicle fuel distributors. The motion was seconded by Commissioner Hart and unanimously carried.

It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that one and one-half times the monthly collections be fixed as a basis for bond on the intermediate cases.

It was regularly moved by Commissioner Barth, seconded by Commissioner Trengove and unanimously carried, the Commission recess at 12 o'clock noon, November 3, 1931, to reconvene at 2:00 P. M.

The Commission reconvened at 2:25 P. M., November 3, 1931, all members present.

Senator Kilcrease appeared as spokesman for the Border Sunshine Way association and read a program adopted at a directors' meeting of that association, held on October 24th. The Association requested

(1) That the Highway Commission authorize and instruct the State Highway Engineer to employ necessary men to control traffic by the flag system on all present and future construction contracts where an adequate and properly maintained, permanent detour is not in operation.

(2) That the Commission recommend to the State Highway Engineer, or any other official from the Highway Commission who will represent Arizona at the next American Association of Highway Officials' meeting, that the marking and designation, suggested by the Association for U. S. Highways, be presented for approval at that meeting.

(3) That when any more federal aid becomes available to Arizona prior to June 30th, necessitating a supplementary budget, that sufficient State appropriations be included in the supplementary budget to oil surface 58 miles of State Highway 84 from Gila Bend to Casa Grande, also, that sufficient federal and state funds be allocated to oil surface all sections of U. S. 80 from New Mexico to California State Line, and same on U. S. 89 from Nogales to Ash Fork.

State Engineer O'Connell called Senator Kilcrease's attention to the fact the American Association of Highway officials rejected that part about East and West designations and stated it would be necessary for him to study the rest of the communication. Commissioner Barth requested a copy of the communication and Mr. A. H. Condron stated a copy had been prepared for every member of the Commission but had not yet been sent out.

It was regularly moved by Commissioner Hart, seconded by Commissioner Mansfield and unanimously carried that the communication be received and filed.

James M. Hall, Superintendent of the Arizona Highway Patrol, appeared before the Commission and presented a report on field operation of the Highway Patrol for the month of October, a copy of General Orders, No. 1, for all Patrolmen and specifications detailing the uniform to be worn by the State Highway Patrolmen. State Engineer O'Connell stated he would like the official uniform of the Patrol approved by the Commission and that Superintendent Hall was wearing the uniform conforming with the specifications presented. It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that the uniform specifications for the Highway Patrol be approved.

The Commission requested a copy of the General Orders be mailed each member for study and discussion at their next meeting.

The State Engineer presented a letter from Mr. Whitworth, Motor Vehicle Superintendent, concerning the collection of common carrier tax, advising it was his opinion the Department should take advantage of the law and immediately cancel out the registration on all vehicles that had not paid common carrier tax. Attorney Salmon stated these common carriers had failed and refused to make their report when due, but the law provides if the report is not made

within five days after the report is due, the Vehicle Superintendent shall fix the tax and the Attorney General shall file suit.

Commissioner Mansfield stated this tax meant two or three hundred thousand dollars to the State. It was regularly moved by Commissioner Mansfield, seconded by Commissioner Hart and unanimously carried, that authorization be granted the Motor Vehicle Superintendent to proceed immediately against the common carriers for the collection of their taxes.

The Secretary read an opinion from the Attorney General regarding which persons in the Arizona Highway Department come under the provision of the Industrial Insurance Act, and defining which persons of the Department were officials and which were employees. Under this opinion the State Highway Engineer, the Deputy State Highway Engineer, the Motor Vehicle Superintendent and the Superintendent of the Highway Patrol may not be insured in the State compensation fund, stating premiums on compensation insurance for them may not be paid from the highway fund. Chairman Addams asked if there was not some means in which these officials in their line of duty could be insured. Attorney Salmon stated not that he knew of, but the Commission has the power to increase their salary and they can insure themselves. Chairman Addams asked Vice-Chairman Hart to take the chair and moved the Attorney General look further and see if he can find some money with which these premiums could be paid and report at the next meeting. The motion was seconded by Commissioner Barth and unanimously carried. Commissioner Addams resumed the chair.

A letter was read from Wm. M. Murray, Superintendent of the Warehouse, concerning the sale of stock on hand of Model T Ford parts, which are no longer used by the Department. Commissioner Mansfield stated the best thing to do is to call for bids and made the motion that the recommendation of the State Engineer be approved and bids be called for the sale of the Model T Ford parts, or the alternate bid exchanging Model T Ford parts on hand for Model A Ford parts or Chevrolet six cylinder parts. The motion was seconded by Commissioners Trengove and Hart and unanimously carried.

It was regularly moved by Commissioner Hart, seconded by Commissioner Trengove and carried, that the employees in the Highway Department be given a half day holiday on Thursday and Fri-

# Construction Engineers and Foremen

AS OF DECEMBER 10TH, 1931

Name	Position	Project	F.A. No.	Highway	P. O. Address
1—Beeghly, F. J.,	Res. Eng.	6610	80-B	Ashfork-Kingman	Seligman Bx. 185
4—Benson, C. S.,	Res. Eng.	8008	90-A	Tucson-Bension	Tucson Bx. 1986
		8009	18-A	Benson-Vail	1227 N. 3rd Ave.
		8013	79-G	Benson-Douglas	Bisbee, Bx. 177 514-A Tombston Can.
B-2—Bodine, W. E.,	Foreman	5301	Non	St. Johns-Springerville	St. Johns Bx. 132
3—Bolles, L. C.,	Res. Engr.	633	87-E	Globe-Safford	Fort Thomas
1—Bond, R. C.,	Res. Engr.	8914	61	Prescott-Ashfork	326 S. Mt. Vernon, Prescott
3—Brannen, F. C.,	Res. Engr.	6003	99-B	Globe-Showlow	Globe, Box 1342 521 S. Hill St.
F-4—Burdwell, L. W.,	Foreman	8013	79-G-3	Benson-Douglas	Bisbee, Bx. 447
B-2—Claypool, W. K.,	Foreman	1101	Non	Kingman-Topock	Kingman
4—DeArozena, Joe.,	Res. Eng.	8701	97-B-C	Mesa Ruins	Florence, Bx. 167
		8704	94-B	Florence-Tucson	Florence Bx. 1 167
L-1—Freitag, Albert,	Loc. Engr.	9001	Non	Kingman-Boulder Dam	Chloride, Bx. 142
F-3—Gore, Frank,	Foreman	8015	Non	Phoenix-Tempe	Tempe, Bx. 214
2—Halloran, W. J.,	Res. Engr.	6601	89-D	Ashfork-Flagstaff	Williams Box 117
B-4—Hedgpeth, Jess B.,	Foreman	4202	Non	Tucson-Nogales	c/o Tucson Shop
1—Hodgin, Barney R.,	Res. Engr.	6010	98-E	Blythe-Wickenburg	Vicksburg
		7402	98-F	Blythe-Wickenburg	Vicksburg
Holt, M. G.,	Painter	72	Non	Repainting Signs	Phoenix Ofc.
R- Jacobs, F. B.,	Res. Engr.		F.L. 1-A	Blythe-Wickenburg	Quartzsite
(Lab. Research)		6002	F.L. 1-C	Blythe-Wickenburg	Quartzsite
1—Jones, P.,	Res. Engr.	6008	Non	Topock-Kingman	Kingman Box 725
1—Kisselburg, Myron,	Res. Engr.	6619	Non	Tucson Shop & Yard	Tucson Box 1789
4—Koogler, B. W.,	Foreman	130	72-A	Phoenix-Prescott	Peoples Valley Box 25
1—Lang, Geo. E.,	Res. Engr.	8910	Non	Kingman-Boulder Dam	Kingman, Bx. 754
L-1—Lawrence, R. E.,	Loc. Engr.	9001	Non	Solomonville-Springerville	Metcalf (Ph. P. O.)
B-3—McGavic, Louis,	Foreman	7104	Non	Kingman-Topock	Kingman Box 722
B-1—Matlock, W. B.,	Foreman	1101	Non	Kingman-Topock	Kingman Box 722
		6619	Non	Douglas-Rodeo	Ashfork Shop & Yard
		4401	Non	Prescott-Ashfork	Prescott 415 N. Mt. Vernon St. Box 1547
1—Middleton, L.,	Foreman	129	99-A	Globe-Showlow	San Carlos
1—Newhall, A. W.,	Res. Engr.	8906	Non	Holbrook Shop & Yard	Holbrook
Parker, Jas. A.			86-D	Tucson-Nogales	Nogales
Pierce, W. C.,	Foreman	127-6	Non	Bowman Hotel	
3—Rath, A. F.,	Res. Engr.	1502	Non	Miami-Superior	Miami, Bx. 1955
2—Smith, Aiken,	Foreman	131	Non	Wickenburg-Prescott	Prescott Box 58
4—Smyth, Sid,	Res. Engr.	8908	94-D	Florence-Tucson	Tucson Box 2828
Stevens, W. R.			Non	Casa Grande-Picacho	90 N. Church St. (Ph. 3510)
F-3—Strickland, A. A.,	Foreman	1808	Precinct No. 1		Phoenix Ofc.
B-1—Van Dickson, J.,	Foreman	1500	Precinct No. 2		Phoenix Ofc.
4—Van Horn, J. R.,	Res. Engr.	8401	Precinct No. 3		Phoenix Ofc.
		8402	Precinct No. 4		Phoenix Ofc.
			Emergency		Force Account
					Location
					Reconnaissance

day of State Fair week in order to attend the Fair.

Commissioner Mansfield called the Patrol Superintendent's attention to the enforcement of truck speeds on Arizona Highways, requesting they be warned and if they do not heed the warning they be arrested. Commissioner Mansfield stated he had questioned one driver of an oil tanker and he had stated their schedule was from 21 to 28 hours for a round trip from Long Beach to Phoenix, which necessitated the speed of 40 miles per hour.

It was regularly moved by Commissioner Hart, seconded by Commissioner Barth and unanimously carried, the Commission adjourn at 4:30 P. M., November 3, 1931, to meet again at the call of the Chairman.

## Highway Building Could Do Away With Unemployment

An editorial in the *Engineering News-Record* roads as follows on the subject of highway building for the relief of unemployment:

"Road work alone could take care of the entire unemployment emergency, were no other source of work at hand. More than two million miles of road in the United States still want improvement from the dirt-road stage. Reasonable modernization of but half or a third of that mileage within a year would enlist the service of every unemployed worker. Tools might prove short at the start, but they could be provided."

## Every Good Surveyor Knows--

THAT canned tomatoes are both food and drink.

THAT the vernier and lower clamp springs become weak with use, causing an instrument to creep, and that they should be removed and stretched occasionally.

THAT a plumb bob can be quieted by tapping the plumb line with his finger.

THAT the boss does not approve of using the toe of the rodman's boot for a T. P.

# Corrugated Iron Pipe Used As Pier Forms

While corrugated iron pipes filled with concrete have frequently been used as bridge foundations, it was not until recently that corrugated iron was found to be useful as economical temporary forms for such structures.

Roger Pelton, County Engineer of Cochise County, Arizona, has developed the illustrated forms of half sections of cor-

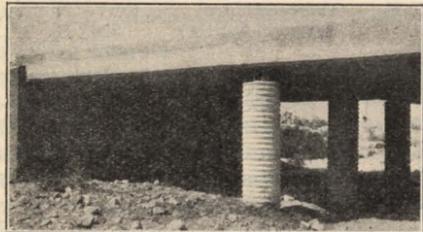
rugated iron pipe attached to lengths of angle iron to be used as removable forms for bridge foundations.

This type of form has much to recommend it because of its 100 per cent salvage value after a pier is set, its long life, and the fact that when its usefulness as a form is ended because of completion of the work, it can give many years of service as a drainage structure.

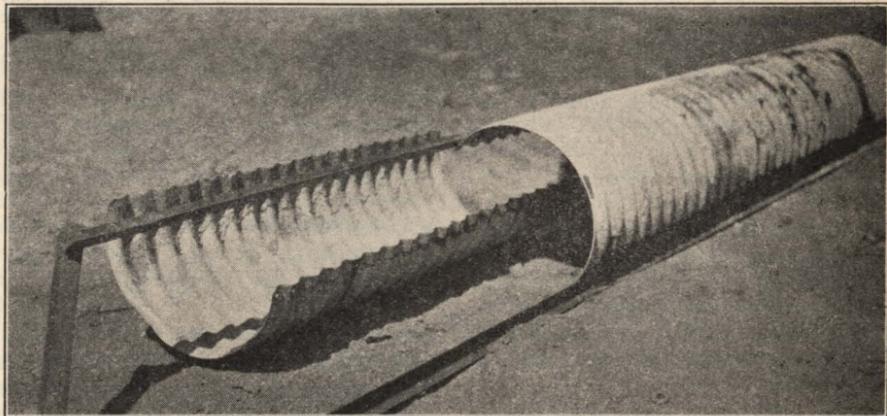
The form is utilized as follows: First the inside of the form is covered with grease and the concrete poured in. After this concrete in the bottom section has

been allowed to set, one-half of the corrugated pipe is removed, lifted up, and attached to the upper length of the angle irons. These angles are just twice the length of the corrugated forms. After this half section is firmly attached to the angle irons in its upper position, thereby assuring a true alignment and

(Continued on Page Twenty)



Bridge piers of concrete after the corrugated iron forms were removed



Corrugated iron forms made of sections of Armco pipe used by Mr. Roger Pelton, County Engineer of Cochise County, in the construction of bridge piers.

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# State Projects Under Construction

### DISTRICT NO. 1

**Geo. B. Shaffer, District Engineer**

Martter and Bock have the grading, draining and sub-grading stabilizer on nine miles, beginning at Crookton and extending west to Seligman, F.A.P. 80-B, 83 per cent complete, Floyd J. Beeghly, resident engineer.

V. R. Dennis Construction Company have construction on grading, draining and placing of sub-grade stabilizer, mineral aggregate and oil surfacing 14½ miles, which begins 1½ miles east of Quartzsite and extends east, towards Salome, F. L. H. P. 1-A, 38 per cent complete, Percy Jones, resident engineer.

Lee Moor Construction Company has the construction of 7.2 miles, grading, draining, surfacing and oil processing, F. L. H. P. 1-C, beginning near Gonzales Well and extending towards Quartzsite, 51 per cent complete, Percy Jones, resident engineer.

Ralph Pleasant has construction of sections E. and F. of F. A. 98, 24 miles grading and draining, beginning 16 miles east of Quartzsite and extending east, 78 per cent complete, Barney Hodgkin, resident engineer.

Packard and Tanner have the construction of 1.1 miles, located approximately 11 miles N. E. of Congress Junction, 2 per cent complete, George Lang, resident engineer.

Pearson, Dickerson and J. C. Morse have started construction on the oil processing, by the road mix method, of approximately 17½ miles, beginning at Kingman and extending west, M. Kisselberg, resident engineer.

### DISTRICT NO. 2

**F. N. Grant, District Engineer**

O. F. Fisher has the grading, draining and surfacing of 7.8 miles, beginning one mile east of Williams and extending east to Pitman Valley, F. A. 89-D, 98 per cent complete, W. T. Halloran, resident engineer.

Packard, Tanner and Morse have completed the grading, draining and surfacing of nine miles, beginning at Pitman and extending toward Flagstaff, F. A. 89-E, R. C. Bond, resident engineer.

### DISTRICT NO. 3

**R. C. Perkins, District Engineer**

Chas. Willis and Sons have the con-

struction of 10.8 miles of the Globe-Showlow highway, beginning ½ mile east of Globe and extending northeast, F. A. P. 99-B, 60 per cent complete, Carl Brannen, resident engineer.

Lee Moor Construction Company has the grading, draining and sub-surfacing of 11½ miles of the Globe-Showlow highway, beginning at Salt River and extending south, F. A. P. 99-A, 24 per cent complete. Gus Rath, resident engineer.

Dudley Stone Products Company has the sub-surfacing of approximately 8 miles, which begins approximately six miles east of Geronimo and extends east, 45 per cent complete, L. C. Bolles, resident engineer.

### DISTRICT NO. 4

**W. R. Hutchins, District Engineer**

Stanley Jaicks has completed the construction of F. A. Projects 25-B and 86-D, 9.2 miles, extending south from the Pima-Santa Cruz county line, 96 per cent complete, Sid Smyth, resident engineer.

Skeels and Graham have the grading, draining and placing of sub-sur-

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At present constructing Arizona F. A. P. 604-95B, which consists of grading and drainage of forty miles of U. S. Highway 89. Beginning at the suspension bridge across the Little Colorado River at Cameron and extending northward toward the Lee's Ferry Bridge on the Flagstaff-Fredonia Highway.

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facing of 13 miles, F. A. P. 97-B, beginning at the south end of the Sacaton Bridge and extending south, 98 per cent complete, Joe De Arozena, resident engineer.

Skeels and Graham have completed the surfacing and oiling of two miles, beginning at Coolidge and extending north, F. A. P. 94-B, Joe De Arozena, resident engineer.

William Peper has the construction of 2½ miles, beginning approximately five miles north of Bisbee and extending north, F. A. P. 79-G, 95 per cent complete, C. S. Benson, resident engineer.

N. G. Hill Company has the surfacing and oiling of approximately 17 miles from Casa Grande to Picacho, 62 per cent complete, J. R. Van Horn, resident engineer.

Skeels and Graham have been awarded a contract for seal coating approximately 22½ miles of the Tucson-Florence highway, F. A. Projects 90-A and 18-A, C. S. Benson, resident engineer.

Skeels and Graham have the surfacing and oiling of five miles, beginning at the north end of the Sacaton Bridge and extending northwest, 98 per cent

complete, Joe De Arozena, resident engineer.

### Corrugated Iron Pipe

(Continued from Page Eighteen) preventing any movement of the angles, the other half section is moved up and the concrete poured.

This method gives a true, straight pier without offsets at the different section elevations. An example of the type of work resulting from the use of these forms, after the sections of Armco pipe have been removed, is shown in the accompanying photograph. The forms shown in the other photograph have been used three times.

The size of the pier, of course, is determined by the diameter of the pipe. Practically any size can be used.

### RIDE IN YOUR CAR

Automobiles are built to ride in, not on, says a warning from the National Safety Council. Adults usually show better sense, but school boys, (and some girls too) seem to think that even if a car is filled up, it will carry a few more on the running board, the spare tire, or the bumpers.

### Gasoline Consumption Not Affected By Depression

In the face of the customary increase in motor vehicle registration each year, the consumption of gasoline shows a marked increase in the first half of 1931 as compared with the first half of 1930, according to W. R. Smith, president of Road Builders Association.

Statistics of gasoline consumption give a total of 7,118,000,000 gallons for first half of 1931 in contrast with 6,810,000,000 for the first half of 1930, an increase of 2.3 per cent.

It appears evident from these figures that travel by motor vehicle has increased in spite of the depression, whether for recreational or business use.

Due to the fact that many people have put off buying new autos, it seems evident that there will be a rapid increase in motor vehicle registration when business conditions return to normal.

No wife ever has to struggle so hard to repress words as when some gurgling enthusiast gurgles: "Your husband certainly must be a pleasant fellow to live with."

## Bureau Of Public Roads Projects In Arizona

### UNDER CONSTRUCTION

Everly and Allison of Des Moines, New Mexico, have the grading and draining of 16 miles through the Petrified Forest National Monument in Apache and Navajo Counties. Estimated cost of construction is \$115,000 and work is now 80 per cent complete. E. F. Strickler, resident engineer.

The W. E. Callahan Construction Company has the contract for the construction of the Rio Puerco and Dry Creek Bridges within the Petrified Forest National Monument at an estimated cost of \$155,000. Work is now 50 per cent complete. E. F. Strickler, resident engineer.

Hodgman and MacVicar have the contract for the grading and drainage of 20 miles of the Pine-Winslow Forest Highway Route 10, beginning approximately seven miles north of Clint's Well and extending to the North Forest Boundary 30 miles southwest of Winslow. Contract time began June 27th and work was closed down for the winter on November 7, at which time the project was 70 per cent complete. Estimated cost of project is \$112,000.

R. S. Black has the contract for the construction of 6.3 miles of the Pine-Winslow Forest Highway in Coconino County. The project begins at Clint's Well and extends northeast to a connection with the south end of the 20 mile project under construction by Hodgman and MacVicar. Estimated cost of construction is \$48,000 and contract was 62 per cent complete when closed down for the winter on November 7th.

Heitsch and Bitten have the contract for placing a seal coat on 19 miles of the Grand Canyon-Desert View Route within the Grand Canyon National Park. Estimated cost is \$14,000 and work was 20 per cent complete when closed down for the winter on November 7th.

Unit 4 of Project 11, near Heber, on

the Payson-Holbrook Highway, was completed on November 5 by Rogers Bros. Length of project was 0.5 mile and the cost was \$2,500. D. L. Williams, resident engineer.

Unit 5 of Project 11, near Heber, on the Payson-Holbrook Highway was completed on November 7 by H. I. Turley. Length of project was 1 mile and cost was \$2,500. D. L. Williams, resident engineer.

Unit 6 of Project 11, near Heber, on the Payson-Holbrook Highway, was completed on November 7 by Glenn Shumway and cost was \$2,500. Project was 0.55 mile in length. D. L. Williams, resident engineer.

Units 7, 8 and 9 of Project 11, near Heber, on the Payson-Holbrook Highway, were 75 per cent completed when closed down for the winter on November 7. The total length of these three station contracts is 1.1 miles and the estimated cost is \$6,000.

Geo. H. Oswald has the contract for the subgrade reinforcing and oil surfacing by the plant mix method, 17.199 miles of the Grand Canyon-South Approach. Estimated cost is \$135,000. Subgrade reinforcing will be completed this winter and oil surfacing laid in the spring. Project is now 35 per cent complete. V. G. Watson, resident engineer.

Howard Smith et al of Thatcher, Arizona, has the contract for grading two station contract units of the Swift Trail, 26 miles southwest of Safford. The combined lengths of the projects are 0.8 mile, estimated cost \$2,700 and work was 60 per cent complete when closed down for the winter on November 7th.

Charles Ballard of Snowflake has the contract for moving and re-erecting an 80 foot steel span bridge from Leroux Wash near Holbrook to Buckskin Wash near Heber. Work began November 2nd and was closed down for the winter on November 20th.

### BIDS OPENED

R. L. Sharp of Nutrioso submitted the low bid on October 27 for placing 2,300 cubic yards of subgrade reinforcing material on 2.2 miles of the Clifton-Springerville Highway near Springerville. Award has been made to Sharp and work is now underway.

Bids were opened November 19 at the Petrified Forest National Monument for subgrade reinforcing of three station contracts, a total of 8 miles, of the Petrified Forest Highway. Award of two of the station contracts has been made to B. R. Tenney of Alpine and award of one contract to Erastus Skousen.

Bids were opened November 17 at the Grand Canyon for grading and drainage of 7.1 miles of the Cameron-Desert View

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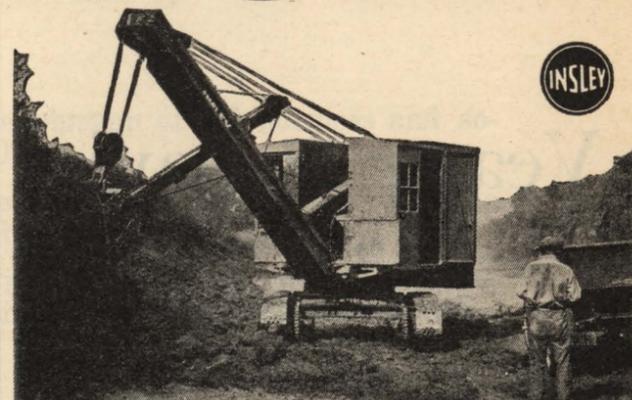
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Highway. Everly and Allison of Albuquerque, New Mexico, were low bidders and contract has been awarded to them. Work has not yet started. Total estimated cost of construction is \$180,000.

Bids were opened November 24 at Phoenix for the grading and drainage of 6.32 miles of the Oak Creek Highway between Indian Gardens and the "Call of the Canyon" resort. The Utah Construction Company of Ogden, Utah, was low bidder and award has been recommended to them. Estimated cost of construction is \$175,000.

#### SURVEYS

Hermit Rest Survey and Hermit Rest to a connection with Bass Camp Survey. Located on the South Rim of the Grand Canyon in the Grand Canyon National Park. Approximately 12 miles in length. F. H. Horton, locating engineer.

A resurvey is being made of the line between Grand Canyon Village and Bass Camp and Mannikaja Spur to the west, approximately 36 miles in length. J. H. Brannan, locating engineer.

Follow other vehicles only as closely as is reasonable and prudent so you can stop safely if an emergency or other unusual condition is met on the road.

## Low Cost Of Construction An Incentive To Building

Mr. Frederick E. Everett, President of the American Association of State Highway Officials, estimates that construction prices are about one-fifth lower at the present time.

"The usage of motor cars is still in advance of the supply of modernized highways," Mr. Everett declares. "The vagabonds, the commercial car users, the tourists and the week-enders pile up in excess of one hundred billions of miles yearly. The bulk of this travel, half at the very minimum, uses the Federal System.

"Federal Aid roads, which are comprised of seven per cent of the roads in each state, have a total length of 197,000 miles. Of this mileage, 39 per cent was paved with high type surfaces by July 1, 1931, and 40 per cent was improved with low or medium quality of surfacing on July 1, 1931.

"In view of the fact that much of the low type of surfacing causes high maintenance costs and it is economy to construct surfacing that will meet the traffic needs, it is clearly evident that now

is the time to build more roads of a higher type. The prevailing low construction costs will, of course, mean that greater mileages can be built. Today's construction dollar will buy more than any dollar since that of June, 1922. The purchasing power of the dollar in November was approximately one-fifth more than the average purchasing power of the dollar in 1929. This means that six miles of road can be built now for the cost of five miles back in 1929.

"Considering these low costs and the efficiency of engineers and contractors, 1932 will unquestionably bring a big advance in the battle against poor roads, thousands of miles of which are costing as much or more in their present state than they would if properly improved," concluded Mr. Everett.

Let the automobile driver remember when he complains about trucks on the roads, that no man ever took a truck out on the roads for a joy ride; the truck is on the road because it is doing a constructive business.

## Road Conditions, Arizona State Highway System

These conditions were reported as of December 4, 1931. Changes will occur on roads under construction according to progress of the work. (Editor's Note).

U. S. Route 80, Yuma to Rodeo, 518 miles. All paved, oil surfaced or gravel—condition good. Two and a half miles under construction, Bisbee Hill. No detours, good condition.

U. S. Route 66, Topock to Lupton, 396 miles—gravel surface, oiled or paved. Condition good, excepting nine miles under construction east from Seligman, one short detour and three mile detour, good condition. New road completed and open to traffic.

U. S. Route 180, Florence Junction to state line, 183 miles—gravel or oil surfaced—condition good. Construction east of Geronimo nearing completion.

State Route 88, Apache Trail, Apache Junction to Globe, 83 miles—gravel surface. Condition good.

State Route 73, Cutter to McNary, 104 miles, gravel surfaced Cutter to Rice and White River to McNary, other unimproved. Snow and mud. Condition poor.

State Route 71, Coronado Trail, Clifton Junction to Springerville, 157 miles—gravel and partly surfaced. Open to Pine Flat, 45 miles above Clifton. Remainder closed November 14th.

State Route 84, Tucson to Gila Bend, 124 miles. Oil surfaced Tucson to county line, gravel surface to Casa Grande. Gravel surfaced to Gila Bend. Road under construction Red Rock to Casa Grande.

and Tucson under construction. Condition good.

U. S. Route 70, Holbrook to State Line, 109 miles—gravel surfaced, condition good to excellent.

State Route 79, Prescott to Flagstaff, 91 miles—Gravel or oil surfaced to Sedonia, Sedonia to Flagstaff graded and drained. Condition good excepting for construction in Oak Creek Canyon which at times is impassable. Sedonia to Flagstaff slow in wet weather.

State Route 74, Wickenburg to Ehrenberg, 134 miles. Surface mostly low type improved. Fifty-one miles under construction from Gonzales Wells east. Detour county road Quartzsite to Bouse to Vicksburg. Other detours slow when wet.

State Route 81, Douglas to Safford, 128 miles—Gravel surfaced. Condition good.

State Route 87, Chandler to Picacho, 51 miles—Gravel or oiled surfaced.

State Route 187, Sacaton Dam to Casa Grande, 13 miles—Gravel surfaced. Condition good.

State Route 83, Vail Junction to Sonoita, 28 miles—Gravel surfaced. Good.

State Route 82, Nogales to Tombstone Junction, 70 miles—Gravel surfaced. Good.

U. S. Route 89, Nogales to Fredonia, 660 miles—gravel, oil and paved surface to Flagstaff, graded and drained to 40 miles north of Cameron. Construction completed. Nine miles between Nogales

#### RESEARCH MEETING IN DECEMBER

The Eleventh Annual Meeting of the Highway Research Board, National Research Council, will be held on December 10 and 11, 1931, in Washington, D. C. The meetings will be in the Auditorium of the National Academy of Sciences, 2101 Constitution avenue.

The sessions will be devoted to discussions of reports of research activities in relation to Highway Finance, Transportation, Design, Materials and Construction, Maintenance and Traffic.

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**NOTICE TO CONTRACTORS**

**Benson-Douglas Highway F. A. 79-G  
Schedule 2.**

**Bids Opened December 17, 1931**

Sealed bids for the construction of the above named project will be received until 2:00 P. M. on the above date, and then publicly opened and read at the office of the Arizona State Highway Commission, Phoenix, Arizona. No bids will be received after the time specified.

All bids must be marked upon the outside of the envelope "State Highway Contract, Benson-Douglas Highway, F. A. 79-G, Schedule 2", and **MUST CLEARLY SHOW THE NAME OF THE BIDDER ON THE OUTSIDE OF THE ENVELOPE.**

The work, which begins at a point approximately three and one-half (3½) miles northwest of the City Limits of Bisbee, and extends southeasterly toward Bisbee about two and one-half (2½) miles to Mule Pass Summit, consists of the Grading, Draining and Placing Subgrade Stabilizer, and is to be completed on or before July 31, 1931.

**APPROXIMATE QUANTITIES**

**Roadway**

- 190 Squares Clearing & Grubbing
- 95,000 C. Y. Roadway Excavation
- 4,500 C. Y. Drainage Excavation
- 4,500 C. Y. Slides & Overbreakage
- 800 C. Y. Structural Excavation
- 300 C. Y. Borrow Excavation
- 3,800 C. Y. Selected Borrow Excavation
- 1,900 C. Y. Mi. Haul of Selected Borrow
- 35,200 Sta. Yd. Earthwork Overhaul
- 6,700 C. Y. Subgrade Stabilizer
- 20,800 C. Y. Mi. Subgrade Stabilizer Haul

- 240 C. Y. Concrete
- 12,000 Lb. Reinforcing Steel
- 28 Lin. Ft. 18" C. M. P.
- 1,032 Lin. Ft. 24" C. M. P.
- 438 Lin. Ft. 30" C. M. P.
- 1,158 Lin. Ft. 36" C. M. P.
- 22 Lin. Ft. Resetting 18" C. M. P.
- 22 Lin. Ft. Resetting 24" C. M. P.
- 6,540 Lin. Ft. Cable Road Guard
- 1,000 Lin. Ft. Standard Line Fence
- 4 C. Y. Removal of Old Concrete

**Bridge**

- 200 C. Y. Drainage Excavation
- 140 C. Y. Structural Excavation
- 115 C. Y. Class "A" Concrete

**10,900 Lb. Reinforcing Steel**

No contractor shall be eligible to submit a bid until his attested statements, made on forms supplied by the Arizona Highway Department, of financial resources and construction experience and equipment have been approved. Bids will be made only upon the bidding form contained in the pamphlet and supplied by the Department, and which form will be supplied only to contractors whose statements show sufficient financial resources and construction experience and equipment to properly construct the work.

All bids shall be accompanied by an unendorsed, certified or cashier's check only, of not less than five (5%) per cent of the gross amount of the bid payable to the State Treasurer of Arizona.

The right is reserved, as the interest of the State Highway Commission may require, to reject any and all bids, to waive any informalities in bids received, and to accept or reject any items of any bid unless such bid is qualified by specific limitations.

**STANDARD SPECIFICATIONS**—Copies of the Standard Specifications, Issue of October 1930, may be purchased for Three (\$3.00) Dollars the copy. Checks should be made payable to T. S. O'Connell, State Engineer.

**PLANS & PAMPHLET (For Bidders ONLY)**—Copies of the Plans and Pamphlet may be issued to qualified contractors having a copy of the Standard Specifications of above issue, and upon deposit of Ten (\$10.00) Dollars. Deposit will be refunded should Plans and Pamphlet be returned within ten (10) days after opening of bids.

**PLANS & SPECIAL PROVISIONS (For Non-Bidders)**—Copies of the Plans and Special Provisions, without Bidding Schedule, may be obtained upon deposit of Ten (\$10.00) Dollars. Deposit will be refunded should Plans and Special Provisions be returned within ten (10) days after opening of bids.

The Standard Specifications of the Issue of October 1930, shall be used.

The bidder will be required to comply with the provisions of the Specifications and Contract in bidding and the award and execution of the Contract.

T. S. O'CONNELL,  
State Engineer.

Phoenix, Arizona,  
December 3, 1931.

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A tabloid newspaper, (offering \$1 each for "embarrassing moment" letters, received the following epistle:

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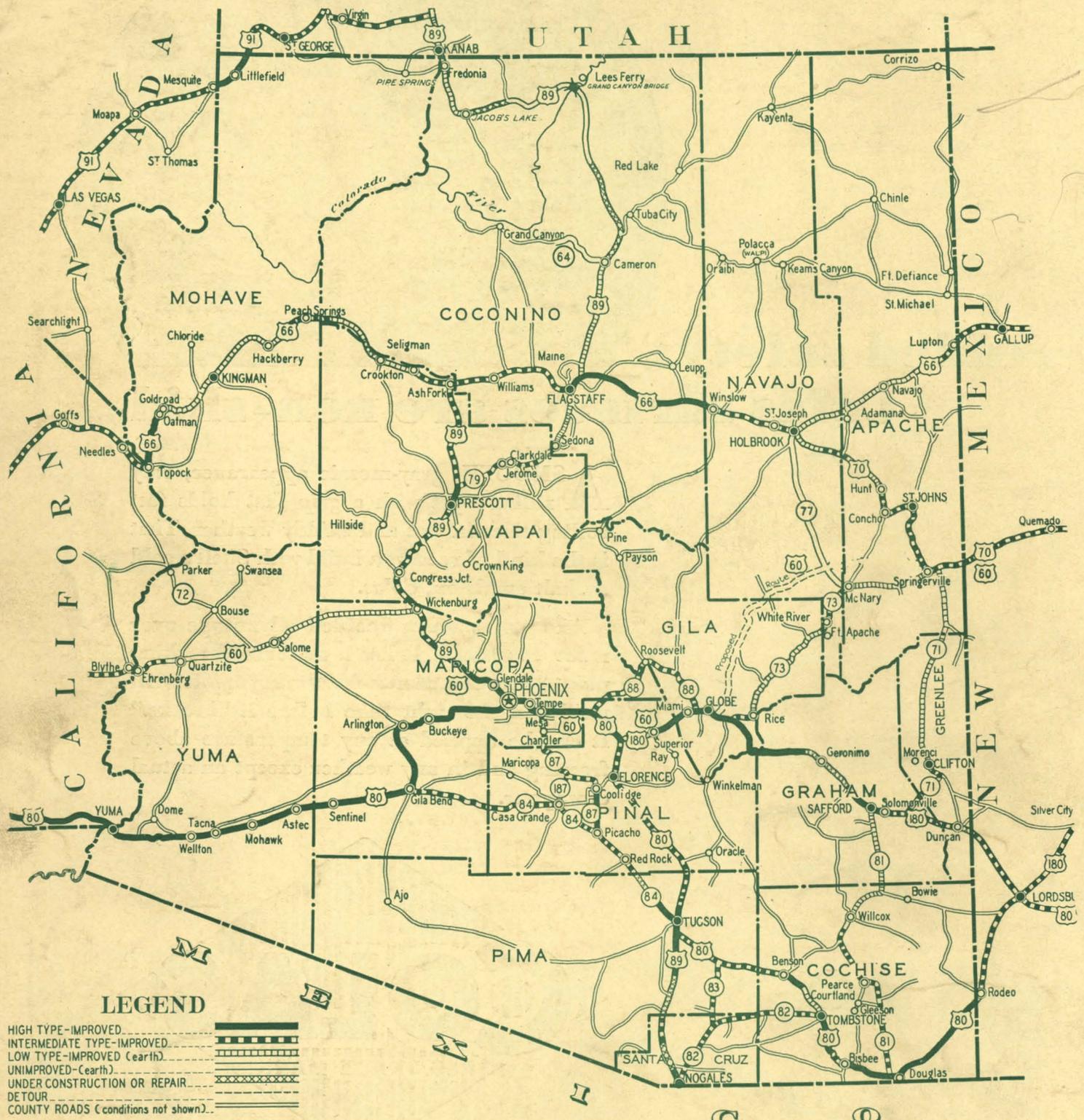


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- DETOUR
- COUNTY ROADS (conditions not shown)

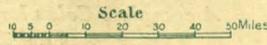
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STATE ROUTE MARKER

## ARIZONA HIGHWAY DEPARTMENT CONDITION MAP OF STATE HIGHWAY SYSTEM



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