WESTERN CONSTRUCTION

DECEMBER 1953

FEATURED THIS ISSUE

Where, when and how to use the powered concrete cart

●

AGC invests in education: College engineers pay off

●

Race with the rains on a small earthfill dam job

●

COVER . . . . . see page 4

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WESTERN CONSTRUCTION

Volume 28 **DECEMBER 1953** Number 12

ARTICLES

DEPARTMENTS

FRONT COVER

PLACEMENT of 925,000 cu. yd. in this earth and rock embankment took just 17 weeks during the summer and fall of this year as John Delphia Co. beat the season in completing construction of Peters Dam for the Marin Municipal Water District in California. This narrow canyon site and elevation differences between borrow pits and embankment made the job even "tighter." The story of this one-season dam begins on page 57.

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The public eye (for detail)

In their every-day aspect, the public relations practices of engineering and contracting groups come down to a matter of attention to detail. Someone must "cover all the bases" in advance of an operation that is to take place before the public eye. Otherwise, these bases are unfailingly covered afterward by critics who find their voices in the local newspaper "forum."

In San Francisco recently, several events combined in unfortunate sequence while a large vehicle-commuting public was still smoldering over earlier traffic snarls that had accompanied ceremonial opening of a new section of freeway. Work had now moved to another piece of right-of-way, with narrow channelization being established on an existing boulevard to make room for adjacent parallel construction during the next 20 months.

Then, on the first day that the narrow, off-center laning was in effect (1) the traffic policeman normally assigned to a major intersection had his day off and (2) the contractor let a small work crew begin digging a trench across two of three traffic lanes during the morning rush hour!

Tempers flared again. But this time, despite quick action and public statements by engineers and contractor alike, the damage had been done. The effect of the succession of incidents now appeared not on Page One, or in the Forum, but on the sports page.

A weekly newspaper feature cartoon devoted to the anticipated Saturday performance of local football teams was built on the theme of freeway traffic jams. An expected victor was portrayed as an outsized motorist completely blocking traffic, in this case his football opponent. The background of this freeway construction scene included a sleeping crane operator of "Snafu Const. Co." and a billboard paraphrasing those actually displayed on California freeway projects: "Another freeway for your aggravation."

It is difficult enough to overcome adverse public reaction at the time of a "situation." But, when Page One is open to both sides, the issues can be met squarely. However, San Francisco's situation has taken the stature of a local joke. A vague reference alone—as in the cartoon—now evokes a response, without a story's having to be told. This is evidence of a state of public opinion that applies not just to one contractor and one traffic jam, but to contractors and street work generally. If this situation is only a "detail," it is certainly time for attention to detail.

Rubber roads can bounce

There is a feeling both among highway engineers and among engineering proponents of various "rubberized" asphalt pavements today that development of these pavements is proceeding in inverse order so far as two particular phases are concerned. In their proper order these are (1) laboratory research and (2) project construction. The following remarks of one authority in asphalt technology define today's facts well and also express with conviction the possibility that rubber roads may "bounce" to the detriment of engineering practice unless the developmental emphasis is changed.

"I am surprised at the lack of information, particularly with regard to the actual effect of rubber on asphalt, that exists. If the proportion of promotion versus research could only be reversed . . . the laboratory data would be far more valuable than the series of 'test roads' that are now being blanketed over the country. Test roads are all right, but they must be backed up, and preferably should be preceded, by intensive laboratory research. Some of the 'research' that has been done is, I feel, superficial and almost valueless.

"Different asphalts have different reactions to rubber, and the cause is not yet known. (There are, by the way, quite a few different rubbers and even different forms of these rubbers.) It seems rather reckless to assume that any rubber will improve each and every asphalt."

Planning for plan holders

A bit of administrative research recently performed by the Wyoming Highway Department has significant implications for Western highway contractors. The research was actually a poll of the 48 states on their policies in releasing names of project plan holders in advance of bid dates. (Results of the poll are summarized in the news pages of this issue of *Western Construction.*) Wyoming's new decision is to allow plan holders to post their own names publicly, or not at all, according to their own descretion.

Aside from Wyoming's own decision in the matter, there is one aspect of that state's study and resulting action that is noteworthy in the West. Here is a region where state lines mean little. Western contractors bid Western jobs. It would be well for them, and their subcontractors and material men, to operate under a uniform West-wide policy as to plan holders' name availability. Perhaps Wyoming's newly enunciated policy, a singular attempt to reconcile opposing views on this subject, can be studied and adopted by others, and eventually all, of the Western states.

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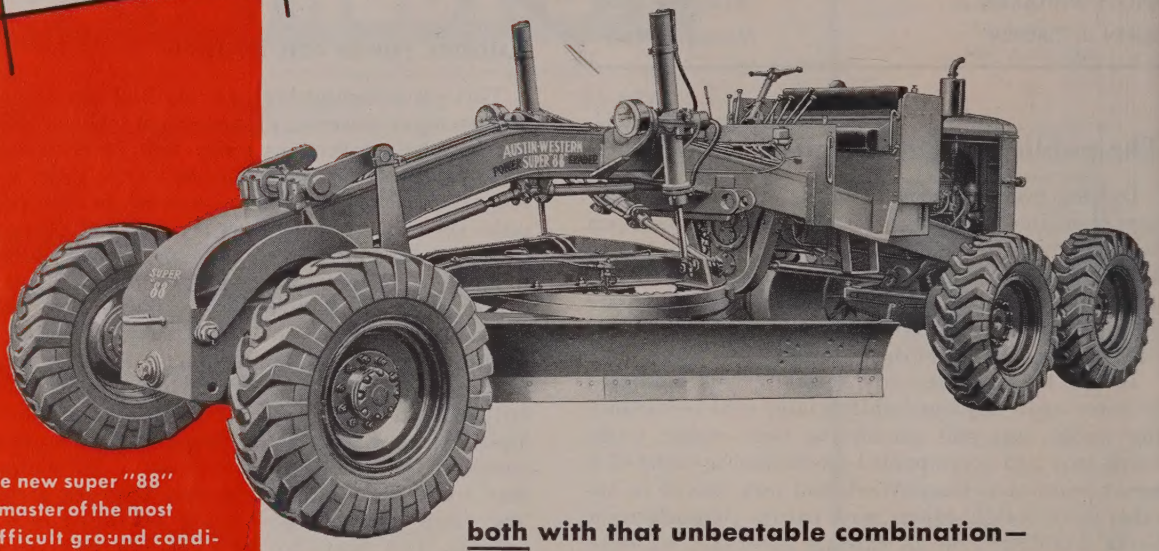

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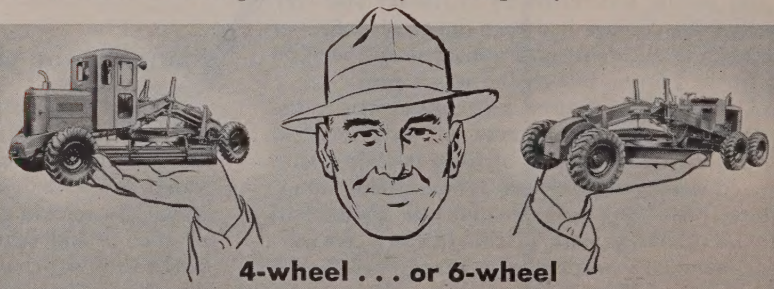

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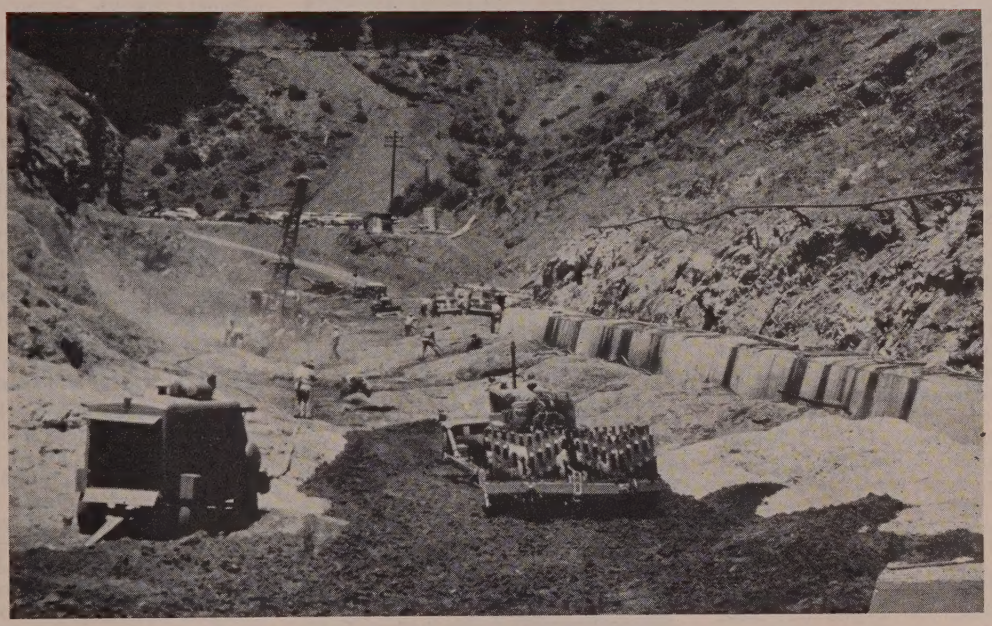
DECEMBER 1953



Earth and rock fill went from these small beginnings to a total of 925,000 cu. yd. in just 17 weeks, but the narrow site of Peters Dam caused earthmoving traffic troubles — Only a 1,500-ft. haul, but 350 ft. of it was elevation — This is a case where —

A small dam is a big problem

By

B. G. GRANT

Project Engineer
Marin Municipal
Water District
San Rafael
California

A RACE against the weather was won in late October when the contractor topped out the embankment to mark virtual completion of Peters Dam in Marin County, California. The dam is a combination rolled earth-fill and rock structure 180 ft. high having a volume of 925,000 cu. yd. It is located in a region where the annual rainfall averages over 50 in., concentrated between the months of November and April. During this period it is virtually impossible to operate any type of earthmoving equipment. Late rainfall this year and overrun in foundation excavation both contributed to the difficulty experienced by John Delphia Co., the general contractor. The dam itself now stands completed, with final work on the spillway deferred until next year.

Delphia's work began last spring with award of the $1,439,530 contract on March 17. As the work got under way, a battery of floodlights was installed to enable embankment placing to be carried on around the clock. While progress was slow at the beginning, due to a restricted working area, the entire embankment was placed in only 17 weeks, with a maximum weekly rate of 89,000 cu. yd. To do this, the contractor worked two 10-hr. shifts, 6 days a week for earth moving and 7 days a week for rock placing. Maintenance and repair of equipment became difficult under this schedule. The rugged terrain proved hard on equipment, and the mechanics and maintenance crew did an excellent job making on-the-spot repairs and keeping downtime to a minimum.

Surveys and clearing were also tough

THE RESERVOIR described in this article more than doubles the storage facilities of the Marin Municipal Water District. The district furnishes domestic water supply to the major portion of Marin County, which is located across the Golden Gate from San Francisco. Construction of this project was financed by bond issue. The dam itself is located on Lagunitas Creek, which drains the westerly slopes of Mount Tamalpais.

The reservoir site presented not only steep terrain, but a heavy growth of timber and underbrush. This growth posed a major problem in reconnaissance of the area. In order to expedite the work, an aerial survey was flown. Water district survey crews furnished ground control by establishing triangulation points along the ridge lines.

Since the reservoir is to be used for domestic water supply, it was necessary to clear the site of all brush, trees and other debris. First contract for this work was awarded at the end of 1951 to Ferd Drayer of Alameda, California, on a unit bid of $535 per acre. The contract called for clearing about 40 acres, including the contemplated location for the dam itself. The same contractor was also low bidder at $748 per acre for clearing another 300 acres in the reservoir area.

Drayer's general method of attack was to send teams of fallers through a parcel to bring down everything in sight. They were followed up by bulldozers equipped with logging winches and by hand crews who piled the debris for burning. A very little timber was suitable for marketing; it was shipped out for pulp wood.

During the summer of 1952, water district engineers explored the cleared area to determine final location of the dam. Diamond drill holes were made in this connection. Also, numerous auger holes were drilled in various locations to determine the extent and location of borrow material.

A final preliminary contract, awarded when the exact dam site had been chosen, was for stripping and grubbing of the dam site and spillway area. This work went to John Delphia Co., later to construct Peters Dam itself.

Design features

Peters Dam will impound 17,000 acre-feet in a narrow reservoir stretching about 5 mi. up the main canyon of Lagunitas Creek, plus an additional 1½ mi. in a major tributary canyon. The base of the dam is about 1,100 ft. thick and the crest length is 750 ft. Studies by the Marin Municipal Water District indicated that a rolled earth-fill and rock structure would be the most economical. Design of the dam includes a central impervious earth zone with rock zones on both faces. A gravel underdrain system has also been included in the downstream toe of the impervious zone, in order to lower the seepage line. This permitted a steeper downstream slope to be used and still obtain the required factor of safety. A stability analysis, based on the Swedish slip-circle method, was made of the embankment and included various drawdown conditions as well as a 10% allowance for lateral seismic forces.

Although the contractor moved on the job in March, it was early July before the first load of dirt was placed in the embankment. The intervening time was spent constructing roads, preparing the foundation and installing outlet pipe. During this period the stream was diverted to one side of the original streambed in an open ditch to permit installation of the outlet pipe. The outlet pipe is a 36-in. cement-lined steel pipe, which was placed in the rock foundation on concrete saddles before anchoring and encasing in a concrete jacket. Late April rains caused flooding during the course of this work, resulting in no permanent damage but adding to the job delays.

Care of water

After being anchored to bedrock, the outlet pipe was encased in reinforced concrete 12 in. thick. A temporary 24-in. pipeline from the upstream cofferdam, located 1,000 ft. above the dam site, was connected into the upper end of the outlet pipe. This arrangement was adequate to handle the summer flows of Lagunitas Creek. In fact, the entire stream flow was allowed to build up behind the cofferdam later in the summer when it became necessary to remove the temporary 24-in. line and connect the permanent outlet pipe to the inlet tower. After this latter work had been completed, and until the lake level built up enough for gravity flow, the small volume of stream flow was pumped into the inlet tower.

Foundation treatment

A geological report showed considerable faulting and fracturing in this region but the foundation, predominantly basalt, proved to be relatively water tight as evidenced by the amount of grouting required. Grout holes were spaced a minimum of 10 ft. apart and ranged from 12 to 100 ft. deep. They were stage grouted from the surface down, thereby permitting increased pressures to be used at the greater depths. The grout curtain is located upstream from the dam axis and extends across the canyon bottom and up both abutments. It will be continued across the spillway entrance.

Earthmoving

Material for the dam was obtained within a 1,500-ft. radius, but a difference in elevation between the dam site and the borrow pits amounted to as much as 350 ft. To meet these conditions the contractor used a fleet of 9 crawler tractor-scraper combinations and three rubber-tired tractor-scrapers for earthmoving. Rock was loaded out by a 2½-yd. shovel into 6 end-dump trucks. The spillway, with a maximum cut of 200 ft., constituted the major borrow area and was the sole source of rock. Remaining fill was obtained from the surrounding hillsides by excavating to depths ranging from 30 to 50 ft.

Moisture control and compaction

Four sheepsfoot rollers loaded with sand and water were used for compacting the embankment. Specifications called for a minimum of 12 passes on lifts averaging 4 in. thick. The double-drum rollers weighed over 35,000 lb. per set. Proper moisture content was achieved on the fill by sprinkling from water wagons since it was impossible to wet down the borrow areas. Other equipment used to control the quality and composition of the fill included a tractor-mounted rock rake and a road grader. Along the abutments, the contractor eliminated much hand tamping by the use of one of his rubber-tired scraper units. Making passes parallel to the abutments, the unit was able to tamp right up against the bank.

Soils testing

The Marin Municipal Water District did its own soils work, performing compaction tests by the Proctor method throughout the job. By the use of methyl alcohol to determine the moisture content of the soil, test results were available within two hours. This method consists of mixing a small soil sample with methyl alcohol and filtering the mixture. By obtaining the temperature and specific gravity of the filtrate, it is possible to ascertain the amount of water present and thereby to calculate the moisture content of the soil. Although this method may be as much as 2% in error, it affords a quick answer which is essential for good and efficient field control.

Once the placing of the embankment was under way, stripping of the abutments to obtain suitable foundation was carried on above the level of the fill by means of a ¾-yd. shovel

d hand labor crews. As the work ogressed, it became necessary to cavate further and further into the llside, and in some locations as uch as 70 ft. of material—measured orizontally—had to be removed be- ore the abutment was acceptable. everal small springs were encoun- ered along the right abutment and ownstream of the axis of the dam. hese required special treatment. A -in. perforated pipe drain was in- talled and surrounded by a 2-ft. hickness of gravel to pick up the pring water. The drain was extended lownstream to connect with the ravel underdrain system of the dam.

nlet tower

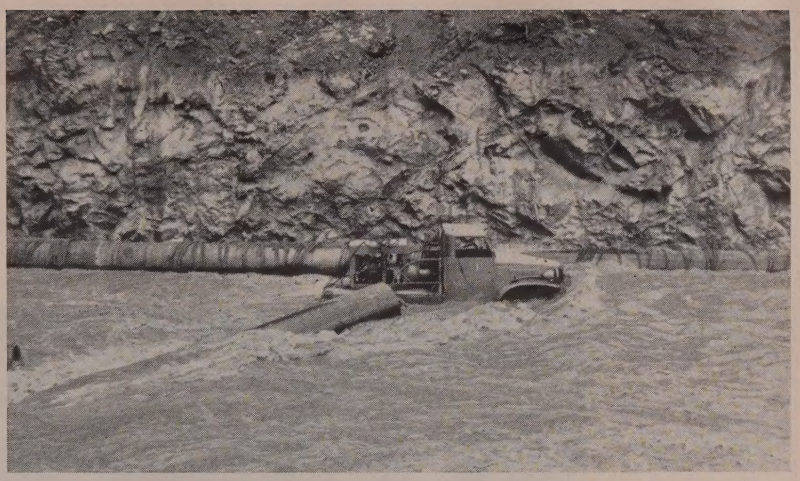
Operation of the control works for his reservoir centers in the inlet ower, an inclined structure anchored nto the natural rock slope of the ight bank. This tower was con- structed by encasing a 48-in. cement- lined steel pipe in a reinforced con- crete jacket. There are six 24-in. sluice gate openings at different ele- vations to permit selection of water at various depths. These gates are operated manually by means of geared hoists mounted on pedestals at the top of the tower. The tower in turn is connected to the outlet pipe located under the dam embankment.

The pipe forming the inlet tower was placed by means of a highline running parallel to the slope of the pipe and operated from the bottom. Concrete was furnished to this work, as well as to encasement of the outlet pipe, by transit-mix trucks operating from a small batch plant near the job. The subcontractor on the concrete work, E. A. Forde Co., installed a small rail line adjacent to the tower, and the concrete was lowered down a 1.4 to 1 slope by means of a ¾-yd. bucket mounted on a rail cart. The straight-sided concrete encasement of the inlet tower was formed by 1x8-in. boards placed vertically. Semi-circular slip forms were used for the top portion of the structure. This combination method of forming was well suited to the irregular foundation.

Spillway design

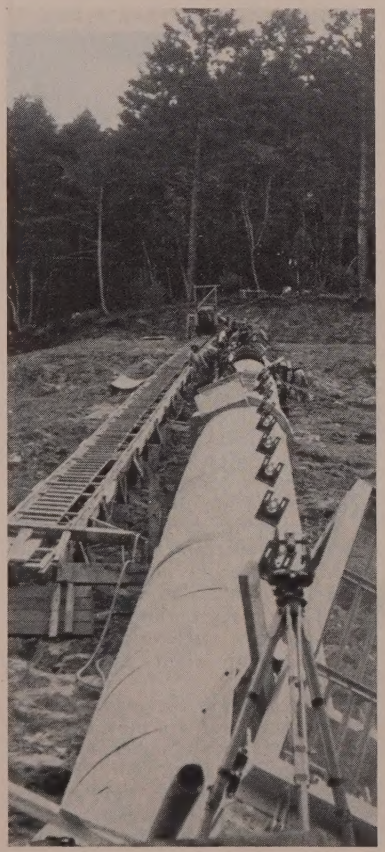
Peters Dam spillway is located in the left abutment and will be a chute type channel with an ogee overflow weir. The weir crest is about 124 ft. long and converges into a 30-ft. trapezoidal channel within a 200-ft. transition length. The spillway is designed for a maximum of 16,000 cfs., with an overall freeboard of 12½ ft. The lower portion of this concrete-lined spillway lies on a 40% grade and terminates with a bucket-type structure for dissipation of energy.

Although construction of the dam was completed before adverse weather conditions set in, there still remains considerable rock excavation to be done for the spillway. In order to prevent any possibility of overtopping during the coming winter and spring, the contractor is concentrating first on excavating the upper portion of the spillway, which will permit overflow water to be discharged without damage to the embankment. As an added safety precaution, the water district will maintain the reservoir at a low level by discharging through the outlet works. Present plans call for completion of the majority of rock excavation during the winter and for final grading and concrete work next spring.



APRIL RAINS brought flash flooding while outlet pipe was being installed. Damage was only slight, but cleanup delays tightened remaining construction schedule.

INLET TOWER is the lazy kind—concrete-encased steel pipe laid against the reservoir bank. Inclined trestle was trick of E. A. Forde, subcontractor, for supplying concrete to slip-form on this pour.



Although this dam was originally known as Big Carson Dam, the board of directors of the water district has voted to rename it in honor of James S. Peters, the present general manager and chief engineer of the district. The reservoir itself is to be known as Kent Lake as a tribute to Thomas T. Kent, a long-time member and past president of the board.

Personnel

Design and construction of the project is under the direction of William R. Seeger, assistant general manager and assistant chief engineer. Consultant has been E. E. Blackie, of Blackie & Wood, civil engineers. H. K. Brainard is resident engineer, with the author as project engineer.

Chief engineer for the contractor is R. H. Heitman. Earl Barnard is general superintendent. Subcontractors to John Delphia Co. include Engineers Limited Pipe Line Co., Jeffries Brothers, Truscon Steel Division, and E. A. Forde Co.

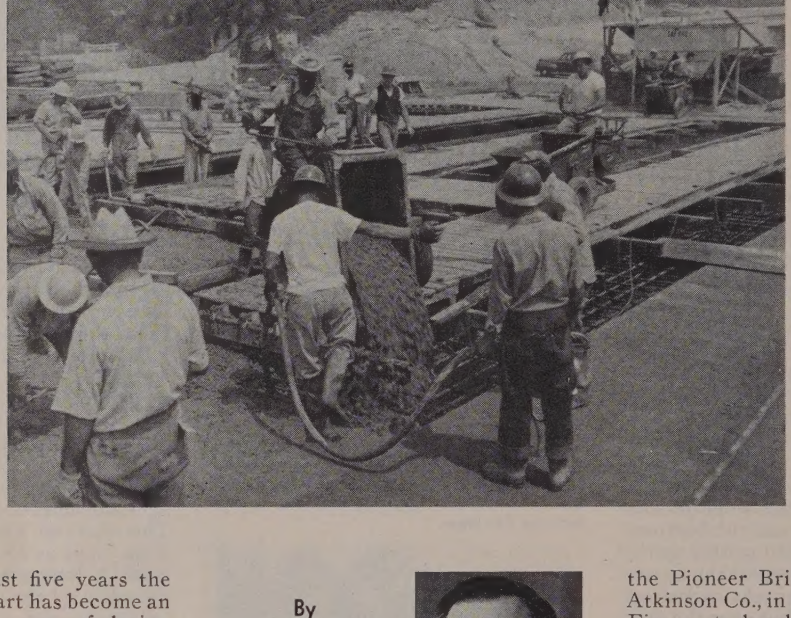
Alaska funds approved

ALLOCATION of more than $11,500,000 in funds for Public Works projects in Alaska for the 1954 fiscal year has been approved by Douglas McKay, Secretary of the Interior, according to Donald R. Wilson, Alaska Public Works district director.

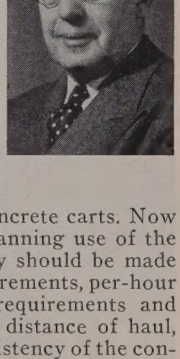
The allocation includes funds for constructing 16 projects and planning of 7 more. Major projects included are improvements to water supply and distribution systems, construction of school buildings, street improvements, and utility systems.

The power-driven concrete cart

. . . calls for job planning to achieve best use. But, just keep the hot-rod operators away and you get savings of 30% in direct substitution for hand-pushed carts



By
A. F. GARLINGHOUSE
General Manager
Gar-Bro Manufacturing Co.
Los Angeles, Calif.



DURING the past five years the power-driven cart has become an increasingly popular means of placing concrete. With more and more of the new units in use, contracting firms and their individual foremen have been asking questions about planning for powered concrete carts, their operational costs and savings, and their flexibility of operation on construction jobs. This article will provide some information in condensed form for men who need to know about this method of concrete placing.

Since introduction of the carts in 1946, they have been used under all conditions and on a wide variety of jobs. At first they were used mostly in situations which previously had called for the use of wheelbarrows or hand-pushed concrete carts. The approaches and runways were those that ordinarily would have been used. But it became evident that faster concrete pouring rates could be attained by changing the runways and by changing the way in which the concrete was delivered to the carts. In fact, there were some jobs on which contractors now found that runways were no longer necessary.

Planning for job requirements

Six or seven years ago it was a case of gradually or casually realizing the differences in job procedure that were either required or possible by the use of power-driven concrete carts. Now it is a matter of planning use of the units. Careful study should be made of operational requirements, per-hour capacity, runway requirements and ground conditions, distance of haul, incline grades, consistency of the concrete handled, etc. Since the carts can be operated on inclines up to 20%, expensive tower and hoisting equipment can often be eliminated—particularly on multi-storied buildings and bridge construction—by the use of ramps. Also, much longer hauls are practical than when using hand-pushed carts.

On a bridge job, for instance, footings and piers are still most economically poured with a bucket and crane. But, since the form work for the bridge deck must be rigidly built, runways for carts are easily added. A recent example of such a job was the Pioneer Bridge built by Guy F Atkinson Co., in Pasadena, Californi Five carts handled the concrete fo the entire deck structure. Concret was delivered to a double-gated re ceiving hopper by transit-mix truck On this job, as on others, use of th hopper helped maintain an even rat of concrete placement. Although on cart could easily take the full charg of a 4-yd. mixer in 12 to 14 min., us of a hopper avoided even that dela for the transit-mix trucks, whic were thereby given a few minute margin against traffic delays betwee job and central mix plant.

Use on building work

On building work carts are now be ing employed for every type of pou In most cases the contractor who use carts maintains a collection of 5 x 5-f runway sections. These are made u with four or five 2x4's running length wise and rough 1x4's nailed across fo a platform. In practice the use of fiv 2x4's has ordinarily proved to b more satisfactory since there is les breakage.

On big slab pours carts can be use without runways, traveling over wir reinforcing without damage to th assembly. Where necessary sma bridges can be provided over condu and piping. On such jobs concret around the edges is usually poure directly from a transit-mix truck

ith the carts taking over to fill in the ajor portion of the area. On inac- essible work above or below ground, oncrete can be moved by skip, by hute, or by crane and bucket to a opper, with carts taking the con- rete from there.

Carts are not restricted to building obs that are all concrete, although he heavy falsework and forming on uch jobs lend to their use. Contrac- ors pouring concrete only in wall orms, where the permanent floor ystem is to be timber, have found it economical to build special runways or their carts either inside or outside he walls.

Varied applications possible

Concrete placement is, of course, he intended use of the power-driven art. However, the units have been sed on many occasions for other ypes of haulage. Excavation in en- losed areas where larger types of quipment cannot enter is a notable econdary purpose. Basement en- argement in an existing building al- nost requires a small truck unit of ome sort if any quantity of dirt is to e handled. And any unframed store loor is wide enough to accommodate cart. It should be remembered, when irt is being hauled, that a high dis- harge point must be provided since he angle of repose of dirt is so steep hat the cart tray must be fully lropped in order to get complete dis- harge. If this isn't possible, the cart perator may use a quick stop with he tray in dumping position to help mpty the tray.

There are other possible uses for he carts. Bricks and concrete block nay be hauled in small quantities to cattered work locations on a project. For example, one contractor found it economical to haul bricks up a ramp o an area where he was building econd-story brick walls. Most con- ractors use carts to haul ramps and orm lumber to and from their loca- ions of use. On larger jobs form ties, einforcing steel in small lengths, and niscellaneous other heavy items are ften hauled in the carts. In roofing vork, large areas of gravel can eco- nomically be spread with carts as the ransporting units. In restricted areas arts have been used to haul and pread large quantities of paving lacktop. And, on occasion, contrac- ors have even been known to use a pare cart for transportation on the ob.

Getting an operator

A question which always comes up n discussing use of carts is the status f the operator. There is, of course, o hard and fast answer. In general, perators are members of the local aborers' union, although there are reas in which other unions claim urisdiction. In 1947 a letter from the ational office of the A. F. of L. sug- ested that the locals place cart oper- tors in the laborers' union, so there is some background for this being done. The pay scale of the cart operator naturally falls in line with his union classification. On some occasions a small hourly extra is added.

The question still comes up, "where can I get men who know how to operate carts?" There are several answers to this. Cart manufacturers and many of the distributors have for some time been training men as operators in cooperation with the unions. Frequently these men list themselves with the factory or distributor so that they can be called in case a job comes up. They are also listed with the local unions, usually under the classification of "buggymobile man." A contractor then can check with the factory, the distributor, and the union with good possibilities of locating men to run his carts. If none can be found, it is always possible to hire men who think they would like the work and have them trained either by the factory or a distributor. As a final resort, a good man can be assigned to a cart, given an instruction manual and some time to try the cart out. One day is usually time in which to find out if he is good enough or if another man should be tried.

Cart operators quickly fall into two general classes, the hot-rod or high-speed operators, and the regular operators. The hot-rodder goes at full speed, starts and stops abruptly, makes lots of noise and appears to be doing a lot of work. On occasion he does do a lot of work, but frequently the maintenance cost on his machine rises above a sensible level. The regular operator, on the other hand, will work at an even speed, usually pouring as much concrete as the hot-rodder. Only the contractor can make a final judgment as to which type is the better.

Maintenance

As with any machine, the cart must be maintained in order for it to do its full share of work. For adequate maintenance it is necessary for the

It started with a wheelbarrow . . .

DEVELOPMENT of the powered concrete cart followed an original conception of a motorized wheelbarrow, which did not prove too successful. From that beginning, power was added to the two-wheeled concrete cart, from which evolved the three- and four-wheeled motorized cart of today.

Practically all of the machines now on the market have been developed since 1946. They are a direct result of close cooperation between the manufacturers of equipment and contractors—large and small—who are interested in greater efficiency in the concrete placing field. Currently, at least five different makes of carts are competing for leadership in this new field of equipment. Three of the makes provide for a rider operator and the other two are basically "walk behind" machines. All the machines have in common the ability to haul greater quantities of concrete at higher speed than can the average worker with a hand-pushed concrete cart or wheelbarrow. At the same time they are designed to operate under the same basic conditions which call for the use of the hand-pushed units.

There are three classes on the market, and there is a place or use for each of them.

(1) Walking type, 6- to 9-cu. ft. capacity, operator walking behind the power-driven unit. This unit has two-wheel traction, and operates at slow speed, permitting its use in soft or wet ground conditions. It is limited for economical operation on long haul work since the operator walks behind it. On short-distance concrete handling, one such cart will replace 2 or 3 hand-pushed carts. It is also useful for handling mortar or plaster on multi-story buildings, since its narrowness permits passing through doorways. It has many industrial applications for materials handling of various types.

(2) Rider type, 9- to 12-cu. ft. capacity. This cart is the most useful and practical for high production when hauling and placing concrete, particularly on larger jobs. Its features are speed (up to 15 mph.) and flexibility of operation. It is built for fast "stop and go" and reversing, short-radius turning, and control dumping. This cart can operate on and discharge from runways 5 ft. wide. Its economy increases in direct proportion to hauling distance. This cart will replace 4 to 6 hand-pushed carts on the same job.

(3) Rider type, 15- to 27-cu. ft. capacity. This unit, with its heavier weight, is most useful on the ground, where its two-wheel traction is advantageous. Despite its capacity, its weight causes it to have less flexibility of application and less flexibility in operation. It is well suited for permanent industrial applications, or for construction jobs of long duration involving long hauls of high concrete volumes.

FAST WORK by powered concrete carts is reflected in a better pace for the whole placing operation, more efficient use of vibrators, form men and finishers.

contractor to have on the job a stock of those parts subject to the worst wear and therefore most likely to need replacement. These parts are few and usually inexpensive. The manufacturer is happy to make a recommendation as to the parts and the quantity to stock.

If a great number of carts are to be used on the job, it is usually wise to have a mechanic available to do minor repair work on them. A man who has had experience in the automotive or tractor field is most satisfactory. The usual mechanic's tool kit will serve his needs.

Planning for major overhauls

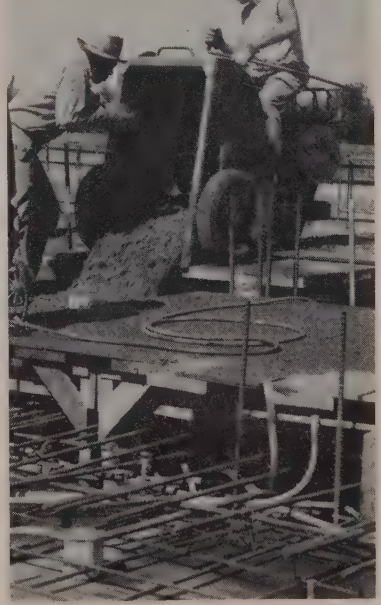
On large jobs of high equipment use or of extended duration it is advisable to be prepared for major overhaul work. A rule of thumb is available to assist in job planning at this point, if the number of hours of cart operation can be estimated. A single-cylinder air-cooled engine can be expected to run from 1,500 to 2,000 hrs. without a major overhaul, under good conditions. After 2,000 hrs. it can be expected to need a reboring job at any time. If operations are carried out under extremely dusty conditions, the hours of trouble-free operation will be many fewer unless good care is taken of the air filter. A contractor figuring on over 1,000 operating hours will do well to consider the facilities for engine overhaul and keep a spare engine on hand. In any case, the manufacturer has recommendations on parts and service stocks.

Maintenance depends on design

Maintenance cost, then, is dependent on the design and construction of the cart, and whether or not the operator is of the hot-rod type. Some carts are simple in design, while others have practically all of the transmission, differential, and operating parts found in an automobile. Some have engines so placed that it is a major operation to repair; others are designed for quick changing of the engine on the job, thereby keeping the cart unit in productive work.

However, all of the carts are of such design and construction that the average mechanic can easily do the repairs. The most important point for control is that of operation: an excellent method is to encourage and rel on the operator to maintain his ow cart. Here is another, important rea son for the employment of operator and not just "drivers."

RUNWAY design depends on the contractor. These are framed in an open manner, then decked with plywood. Built-up legs are necessary on this job, where reinforcing is spaced above slab form and utility work is complex.



Cost considerations

Cost of operation of the carts is a important factor. The wages of th operator may be expected to run 20 an hour more than those of commo labor working with hand-pushe carts. Fuel cost is relatively negligibl amounting to only one or two gallon of gasoline per day.

The main cost factor to be con sidered is the one which arises fron comparison of power-driven carts t hand-pushed carts on a given cycle o operation. Expressed in cost per yar of concrete transported and placed there is a differential—a saving i favor of the power-driven cart—o about 33%. In addition, indirect sav ings result from less waiting time o transit mixers, less congestion o units on runways, more efficient op eration of vibrator and form men an finishers, and, in many cases, the elim ination of expensive hoisting equip ment. The overall savings may com to 50%. If long hauling distances ar necessary, even greater savings wi be made. Also, on multi-story build ings of large area, hoisting towe cannot be eliminated but the need fo them can be greatly reduced. It very seldom necessary to have mor than one tower because of the longe economical hauling distance of powe driven carts.

Conclusion

Carts have revolutionized the con crete handling and placing operation The question today is not whether t use them but how and when to us them. They are here to stay, standin on a record of economical concret handling and versatility of use in con struction. They are a general utilit tool.

Pennybacker of Texas wins 1953 "Dr. L. I. Hewes Award"

RECIPIENT of the "Dr. L. I. Hewes Award" for 1953 is Percy V. Pennybacker, Supervising Field Engineer with the Bridge Division of the Texas Highway Department, in recognition of "his outstanding contributions in the use of welding for the repair and construction of highway bridges." Announcement of Pennybacker as the recipient was made October 9 during the annual conference of the Western Association of State Highway Officials by retiring WASHO President Mark U. Watrous, and the award of $500 and an engraved certificate was made by James I. Ballard, Editorial Director of *Western Construction.*

The Dr. L. I. Hewes Award was founded in 1951 by *Western Construction,* to consist each year of the award of $500 and a certificate to the engineer from the Western states who has made the most outstanding contribution in the field of highway engineering during the past year. Now an official event at the annual WASHO convention, the award was presented for the first time last year. Dual recipients for the 1952 award were Herbert W. Humphres, at that time District Soils Engineer of the Washington Department of Highways, and James T. McWilliam, Assistant Engineer, California Division of Highways.

Why the award

The award was envisioned by *Western Construction* as perpetuating the name and achievements of Dr. Laurence Isley Hewes, who died in late 1950 and was for many years the Western Regional Chief of the U. S. Bureau of Public Roads. His many superlative contributions in every phase of highway engineering gave great impetus to Western highway development, and therefore the award is intended to provide continuing inspiration for younger engineers engaged in Western highway construction and engineering. Dr. Hewes was also one of the principal organizers of WASHO, and it is appropriate that this organization be the medium through which the award is presented. Final selection of the recipient is made by the executive committee of WASHO.

Pennybacker's work with welding

The achievements of Pennybacker meriting for him the 1953 award are the result of his advocacy of welding techniques for the repair and construction of many small bridges in the Texas highway system. Recognizing the advantages of welding in repair work and the increasing difficulty of obtaining acceptable work on small riveted jobs, he urged upon the department's designers the wisdom of utilizing welding as a means of fastening the bracing or diaphragms to the main beams on simple I-beam spans. Later, his conviction strengthened by the success of butt welding steel H-piling under the worst of field conditions, he urged the use of butt-welding of I-beams to secure longer spans, particularly in continuous spans.

From this point of progress to the use of fully welded plate girders was a big step, taken only after a great deal of preparation. Numerous fabricating shops were visited, a great deal of literature was studied, and finally Texas' first all-welded girder bridge was advertised for letting early in 1950. No great difficulties were encountered in its fabrication and erection. Last year, 38 projects were contracted in Texas which involved the design of continuous or deck plate girders.

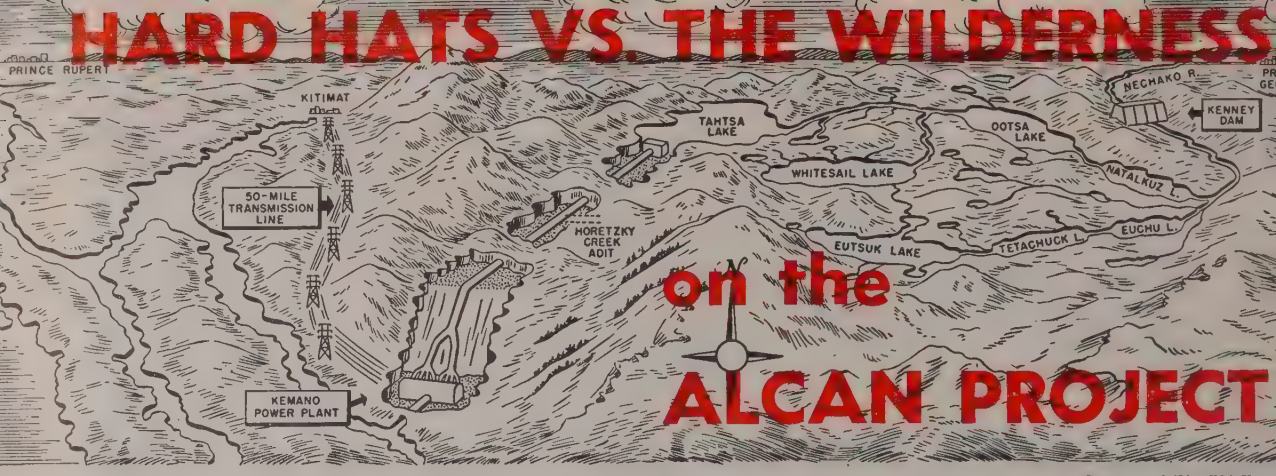
Pennybacker has been the prime-mover in promoting this use of welding. He has organized and conducted schools for welding inspectors in a great many of the districts of Texas. By his efforts, a welding specialist has been hired by the department, and this specialist has proven invaluable in the training of inspectors and welders in district shops.

In recommending Pennybacker for the Hewes Award, the Texas Highway Department committee stated, "We consider his contribution to the increased use of welding with its simplified detailing for structures, its quieter erection, its neater appearance and its money-saving by reducing dead weight, to be outstanding, far above that expected of any single person in an organization like the Texas Highway Department."

Pennybacker has served more than 18 years with the Texas Highway Department. For ten years before coming to Texas, he was employed by a firm of consulting engineers in Kansas City, his work there being primarily concerned with the design and construction of large bridges. He received his B.S. Degree in Civil Engineering from the University of Texas.

D. C. Greer, Texas State Highway Engineer, is handing Percy V. Pennybacker the $500 check which he received in recognition of his outstanding work in welding techniques for bridge construction. Randle B. Alexander, bridge engineer, and John A. Waller, chief engineer of maintenance operations, are also pictured.

HARD HATS VS. THE WILDERNESS on the ALCAN PROJECT



Courtesy of *The EM-Kaya*

PART 2 OF 4

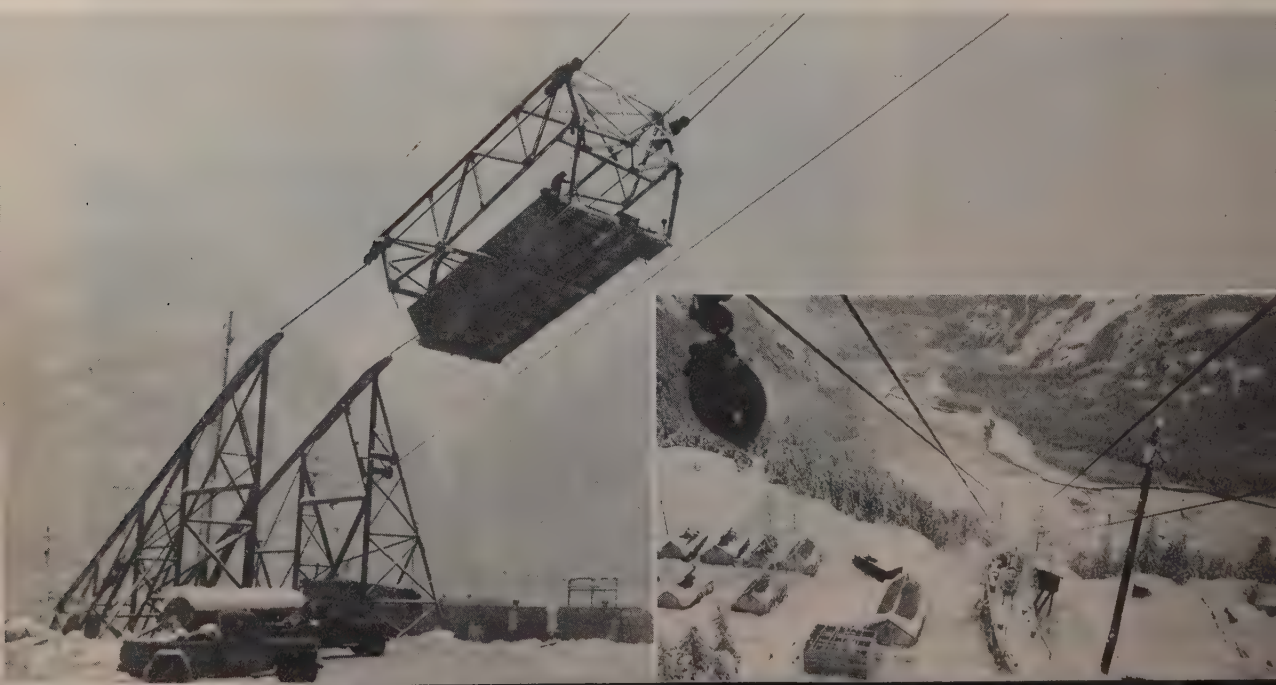
Intake structure and ten-mile tunnel

THE INITIAL development of the Alcan Project requires the driving of a 25-ft. horseshoe-shaped tunnel 10.1 mi. through the Coast Range mountains from the intake at Tahtsa Lake to the penstocks dropping to the powerhouse at Kemano. The slope of the invert is .0025 from elev. 2718 at the intake to elev. 2583± at the surge chamber and penstock at the west end. At one point it is driven under a sizable lake situated in a mountain basin at elev. 3759. This initial tunnel No. 1 will supply water for eight turbine units and will later be supplemented by a similar and parallel power tunnel No. 2 to supply future turbines Nos. 9 to 16.

There are two small horizontal angles in the tunnel alignment permitting a location where an adit 1,700 ft. long is driven from the canyon wall of Horetzky Creek to intersect the tunnel near its middle point. Transportation to Horetzky Creek adit and camp is over six miles of steep mountain road from Camp 5 at Kemano. At the eastern or intake end of the tunnel at Tahtsa Lake the construction adit 1,133 ft. long was driven from a point above present lake level downward on a 3% grade to intersect the tunnel approximately 1,000 ft. from its intake end. The main tunnel was then driven on westward and also back to the intake end. This simplified the water control problem a the intake and permitted the work o the intake structure to proceed with out unnecessary interference.

At the west or powerhouse end o the tunnel an adit or access tunne was driven in from the side of th mountain 450 ft. on the same align ment as the tunnel extended, to inter sect the tunnel where it branches t the two penstocks supplied by it. T reach this heading at elev. 2600 an the adit at elev. 1600 from which th penstock raises from the 1,600 t 2,600-ft. levels were advanced, re quired a major undertaking. This wa the construction of an aerial tramwa from the valley floor at Kemano Small camps are maintained at bot the 1,600 and 2,600-ft. levels, supplie from below. The tramway skip wit

AERIAL TRAMWAY from the valley floor at Kemano, with 20-ton capacity skip, carries men and supplies to tunnel adits at 1,600 and 2,600-ft. levels. Inset below is a view from the skip looking back at the Camp 1600 landing toward Kemano.



capacity of 20 tons is supported at he four corners by sheaves running on two parallel track cables of 2½-in. liameter on 18-ft., 6-in. centers and ,000 ft. long. Nearly 12,000 ft. of 1⅜-n. wire rope is used for the main-and-ail pull line operated by means of a 96-in. double-drum hoist at the 226-ft. level, with a bullwheel at the 2,638-ft. level.

Four main tunnel headings

Thus the main power tunnel is being worked at four headings: westward from Tahtsa to meet the heading being advanced eastward from Horetzky, westward from Horetzky to meet the heading being advanced eastward from Kemano. It is now proposed to line the invert and as much of the arch and wall section as necessary to support the rock and prevent further ravelling. Most of the bad ground requiring support during construction has been in the Tahtsa-Horetzky section where 651 tunnel sets have been installed.

The construction of the intake structure and the driving of the tunnel heading from Tahtsa toward Horetzky are being done by Morrison-Knudsen Co. of Canada crews separately from the main concentration of forces at Kemano. This is because of the mountain barrier between Kemano and Tahtsa, making communication and transportation very difficult. There is radio communication between the two points and transportation, when weather permits, by helicopter or pontoon-equipped planes. All supplies and equipment for the Tahtsa end of the work are brought in by highway and railway to Burns Lake, then 110 mi. by road constructed as part of the project to the eastern end of Tahtsa Lake, thence by outboard diesel-driven barges the 18 mi. across the lake to the facilities at the intake. Forty-ton barges were transported in sections by rail from Vancouver to Burns Lake, thence by road to Ootsa and Tahtsa Lakes where they were assembled.

Intake facilities

The intake structure serves the initial power tunnel No. 1 and will serve the future tunnel No. 2. An approach channel is to be excavated with a 20-ft. bottom width at elev. 2733 and with sides sloping at about 1½ to 1. Six sets of trash racks and trash rakes are provided. The invert of tunnel No. 1 is at elev. 2725 and that of tunnel No. 2 at elev. 2740. The operating floor is at elev. 2810 and a 15-ton traveling crane is provided. No. 2 tunnel will be excavated and lined to a distance of approximately 400 ft. from the intake, at this time. The intake invert being 60 ft. below natural lake level, the dewatering of the work area below the cofferdam presented a major problem. This was met by the use of Stang well points and pumps to remove up to 11,000

FULL-FACE DRIVING is proceeding with similar procedures and equipment at all four main tunnel headings. Job-built steel jumbos travel on gantry rails on 14-ft. centers, with 15 to 21 drills mounted on three decks of front section. Intake area is shown below with slab partially completed for transition. Tunnel No. 1 is at right, Tunnel No. 2 at left.

INTAKE INVERT 60 ft. below natural level of Tahtsa Lake required dewatering of work area within cofferdam. Wellpoints and pumps remove up to 11,000 gpm. of water infiltrating from the lake. Included in facilities for intake are six sets of trash racks and trash rakes and a 15-ton traveling crane.

gpm. of water infiltrating from the lake. Sump pumps with a total capacity of 13,200 gpm. are also used in the intake excavation.

Heavy snows and stoppage of lake transportation during the period when the lake is frozen over, usually from December to May, permit only a comparatively short construction season. A crane on a barge was sent out as early in the spring as practical, dropping a weight to break the ice ahead of the barge to open up the lake for transportation as early as possible. Supplies to the barge and crane crews were delivered by helicopter. A helicopter broadcast lampblack over lake ice, snowy roads and work areas, here and in the pass section of the transmission line, to accelerate melting. By August 1953, the intake structure concrete was above lake level and will be completed this season.

Area geology

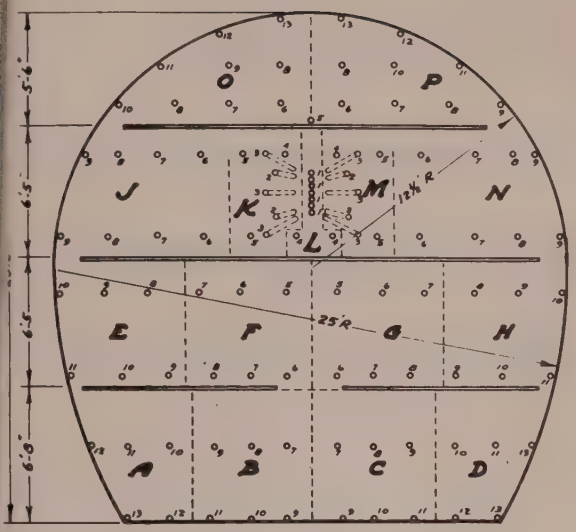
The geology of the area is in general favorable. From Tahtsa to Horetzky the successions of volcanic and sedimentary rocks of the Hazelton group show considerable variation in composition, durability and tightness. At the Kemano end, the excavation, including power tunnel headings, is in the Coast Range Batholith of Quartz-Diorite and Granodiorite. The Granodiorites are intersected by numerous faults and dykes of limited extent. Along the fault lines alteration has occurred.

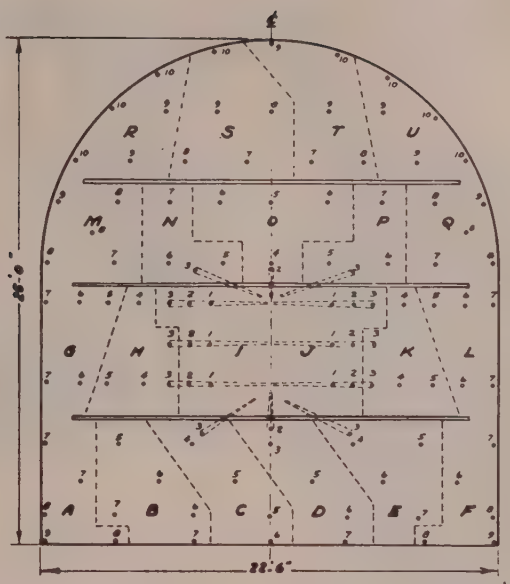
In connection with geology of the region Dr. J. H. Blackwell at the University of Western Ontario, London, Ontario, the B. C. Department of Mines, the Geological Survey and U. B. C. were aware of the opportunity offered by the opening of a tunnel through the mountain range for obtaining data concerning heat flow in the earth. At their request,

Major portable and mobile equipment, Kemano area

Quan.	Item	Manufacturer
171	Cars—Mine, dump, 1½ to 7 cu. yd.	Hyman Michaels, Granby, Frank Cox, Pacific Dry Dock
106	Cars—Light transport	
20	Lt. Stn. Wagons	
5	Sedans	
81	Pickups	Ford V8, Willys, Mercury
51	Cars—Tunnel flat, 36-in. gauge	Vancouver Eng. Works
55	Portable compressors	Canadian Ingersoll-Rand, Gardner-Denver, Brunner, International
19	Cranes	Pitman, Edward Bacon, Michigan, Lorain, Byers, Bay City, Link-Belt, Northwest
120	Drifters	Canadian Ingersoll-Rand, Gardner-Denver
158	Drills—Rock	Copco, Atlas, Multi-Vane, Warsop
16	Drills—Rock, Wagon	Canadian Ingersoll-Rand
6	Dumpcrete-trucks, 4 cu. yd.	Mack, White
10	Dumptors	Koehring
67	Generator sets	B. C. Equip., Elec. Power, Caterpillar, Rendell, National Metal, Onan, Cummins, G. M., Palmer, G. E., Sheppard
12	Graders, motor	Galion, Caterpillar
9	Helicopters	Sikorsky, Bell
39	Hoists, Air	Utility, Canadian Ingersoll-Rand
14	Hoists, Electrical	Hillcrest-Mohawk, Nelson, Anderson, Seaboard, Canadian Ingersoll-Rand
20	Hoists, Mechanical	Lawrence, Powell, Nelson, Chepler, Williams, Minneapolis-Moline, Cummins
27	Locomotives, mine	Goodman, West, Manchu, Nelson, Atlas
3	Loaders, overhead	Malo
87	Motors, electrical, 1½ hp. to 200 hp.	Goodman, Conway, C. G. E., C. Westinghouse, G. E., Crossman
13	Muckers	Gardner-Denver, Goodman, Conway
107	Light plants, 1½ kw.	Kato, Onan, Lister, Koehler, Higgs, Peters, Caterpillar
2	Pumpcretes	Rex
468	Pumps	Wisconsin, Jaeger, Beatty, Bowser, Gilbarco, Delaval, Royal, Blackwell, Gyphoon, Gardner-Denver, Canadian Ingersoll-Rand, Burnett, Wesco, McCulloch, Paramount
117	Pushers, pneumatic	Copco, BMK
13	Scrapers	Karry, Pacific, Bagley, Crescent, LeTourneau
19	Shovels, power, ¾ to 3½ yd.	Bucyrus-Erie, Northwest, Dominion, Lima, Marion, Koehring
2	Slushers, elect.	Canadian Ingersoll-Rand, Anderson Equip.
27	Snow equip.	Sicord, Cyclone, Snowmobile, Frink, Sawyer & Massey
17	Tankers, truck, 900-2,500 gals.	Ferguson-Columbia
14	Tournapulls	LeTournaeu
79	Tractors	International, Caterpillar
19	Trailers, Athey	Athey
36	Trailers, other, 3 to 100 ton	Willys, Columbia, West Coast-Scotia, Freuhauf, Bombarder
270	Trucks, ½ to 25 ton	Willys, Ford, Baughman, Mark, G. M., International, Diamond T, Dodge, Fargo, Euclid, White
46	Vibrators	Chicago Pneumatic
39	Welders, arc, SAE 300	Hobart, Lincoln
5	Yarders	Lawrence, Berger

(Information supplied by office engineer of M-K of Canada)





DRILLING AND BLASTING PATTERNS

Numerals indicate firing order; letters indicate driller positions

25-FT. DIAMETER HORSESHOE (Kemano)—Rock drills, 15 Ingersoll-Rand DA35's. Jumbo, 22-ft., 3-deck. No. 100 Conway loader for mucking. Locomotives, 8-ton Goodman. Cars, 6-yd. side-dump, Granby on 36-in. gauge rails. Drill steel, 1¼-in. round "Atlas," carbon, lug shank. Bits, detachable "Carset," tungsten carbide. Length of holes drilled: cut holes 13 or 15 ft., all others 11 or 13 ft. Length of steel, 5 ft., 8 in., to 15 ft., 8 in. Bit size, 2 to 1⅜ in. new; 1⅜ to 1⅞ first gauge change; to 1⅜ second change; to 1⅝ last grinding. Average total life (footage per bit), 240 ft. Cycle time, in hours and minutes: drilling 1-40, load and blast 0-30, ventilation 0-23, mucking 2-54, miscellaneous 0-48, total cycle 6-15. Typical shift heading crew, 40 men. Number of holes drilled per round, 106. Powder consumption per cubic yard, 1¼ x 8-in. 40% Giant gelatine, 5.41 lb.

22½ x 25-FT. DIAMETER TUNNEL (West Tahtsa)—Rock drills, 21 "Copco" jack legs with pneumatic pusher. Jumbo, 19½-ft., 3-deck. No. 100 Conway loader for mucking. Locomotives, 8-ton Goodman. Cars, 6-yd. side-dump Granby on 36-in. gauge rails. Drill steel, ⅞-in. hexagon "Coromant," tungsten carbide bit inserts. Length of holes drilled: cut holes 5, 10 and 15 ft., all others 13 ft. Length of steel, 2.65 to 15.75 ft. Bit size, 1.34 to 1.14 in. Average feet drilled per grinding, 60 ft. Average total life (footage) per bit, 600 ft. Cycle time, in hours and minutes: drilling 1-27, load and blast 0-40, ventilation 0-24, mucking 3-58, miscellaneous 1-27, total cycle 7-56. Typical shift heading crew, 31 men. Number of holes per round, 107. Powder consumption per cubic yard, 1 x 8-in. 40% Forcite gelatine, 3.2 lb.

(Drawings and information provided by C. W. Abrahamson, Assistant Resident Engineer for "Alcan")

through Alcan, the contractor has drilled holes 20 ft. deep, slanted to drain, generally about 4 ft. above the invert and spaced at 10-, 300-, 600-, 1,000- and 1,000-ft. intervals thereafter in the tunnel as the headings advanced. Portable equipment consisting of Thermistor Bridge, Connecting Cable and Thermistor Cable-Form composed of three thermistor elements and their leads was furnished for simultaneously recording temperatures at three predetermined depths in the holes. The contractor's tunnel engineers are responsible for obtaining the readings and furnishing information on forms provided for that purpose.

Full-face driving

The four main tunnel headings are being driven full-face and generally use similar procedures and equipment. Drilling is done from job-built steel jumbos traveling on gantry rails on 14-ft. centers and moved by storage battery locomotives. The jumbo is in two sections. The front section of three decks provides mounting for 16 standard swing-mounted Ingersoll-Rand, DA35 drifter drills, using 1¼-in. round drill steel and Carset detachable 2-in. tungsten steel bits. However, in the Tahtsa-Horetzky heading the contractor is using pneumatic-fed Swedish-type drills with ⅞-in. drill steel and Coromant chisel-type bits with tungsten-carbide inserts. Bits are reground after every 30 to 60 ft. of use and are useful for a total of 240 to 600 ft. Holes are started at 1.34-in. diameter in the Tahtsa heading and at 2-in. diameter in the other three headings.

Drilling patterns vary somewhat but 102 to 108 holes driven 11 to 13 ft. result in an advance of 10 to 12 ft. per round. Electric detonators are used with time intervals from instantaneous to No. 15 delay. For blasting 1¼ by 8-in. 40% Giant gelatine dynamite is used. After blasting, the fumes are exhausted through 30-in. diameter pipe by 13,000-cfm. Sutorbuilt 22 x 60-in. reversible fans. Fresh air is then forced to the heading so that the crews can return to the heading and start loading out in about one-half hour. Compressed air for drilling is supplied to the headings at 95-100 psi. Procurement and maintenance of compressors and air-operated equipment have been materially expedited by the services of Canadian Ingersoll-Rand and Copco, both of which have representatives on the job. Canadian Ingersoll-Rand also maintains a large stock of parts on the job.

Muck handling

For mucking, a 100-hp. electric two-motored Conway mucking machine is used at each heading to load 5-car trains of 6-cu. yd. mine cars with built-up sides for 7 cu. yd. One motor of the mucking machine handles the loading bucket and machine travel, and the other motor handles the belt conveyor. The train is hauled by combination battery and electric trolley locomotive on 60-lb. rails set at 36-in. gauge. The back or "cherry-picker" section of the jumbo is equipped with

. . . Concluded on page 81

WANTED:

Young engineer, get along well, ability to learn

These are things an employer seeks in an engineer. Here's how you can help him find them.

IT HAS BEEN stated well that the only static population is that in the cemeteries.

The great migration from the Midwest to the Western states during the present century started in the 1930's, reached tidal wave proportions during World War II, and is still continuing at a significant pace. Smaller eddying currents of moving people interplay between states, from West to East, from South to North—and back and forth to Alaska, Hawaii, and other possessions. Americans are on wheels, and they use them.

Movement of population always means job seekers, many of them professional men. The engineer, particularly in his earlier career, is the traditional nomad of the professional group. Doctors get settled in one place; likewise dentists—as well as lawyers. Most engineers finally reach a stage of static equilibrium, but it takes longer!

Because several times in his life an engineer may be looking for employment or a change of employment, it is important that he know not only what he is seeking, but also what the employer desires.

There are variances, of course, in what the employer wants, depending on circumstances. If he has a temporary highball job, he may pay very well to get it done; and then part company without fanfare. His approach is different—very much less thorough—from that of the employer who is seeking an engineer with a potential, say, of twenty years service. Also, the employer's attitude will vary with his own demand and the supply in the market: If there is a shortage of engineers and he has vacancies, he will temporarily and necessarily lower his standards.

Generally, the average employer is looking for three basic factors in the engineer he employs: (a) ability and training adequate to meet the demands of the job which is open, (b) an individual sufficiently adjusted socially to be able to get along with associates and give and take supervision as required, (c) an individual with the interest and ability to learn, become more proficient, and advance in the organization. Also included is the factor of stability—the probability of the candidate staying a reasonable time with the organization.

An employer with a temporary job (or hard-pressed for a candidate) will be primarily concerned with the first factor. But what he is looking for may be at the other extreme. For instance, he may not even have a definite job open, but be willing to employ solely on the basis of the last two factors. A young graduate engineer just out of school is a good example of potential and personality, even when there is not a specific position.

What you encounter will vary

What you as an engineer seeking employment will encounter depends on the organization you contact. If it is a small engineering or contracting firm, you may have the informality of an interview sitting on the running board of a truck, hobnobbing casually with the superintendent. If it is a large corporation you may have to go through several offices, be interviewed a number of times, and submit to a battery of tests. Either way, the object from the employer's standpoint is the same: to select the best man for the job and for the organization's future.

You may come across a personnel man. Such a man has the ability to inspire confidence in all kinds of people; faculty of being a good listener; adaptability; freedom from prejudice; ability to talk the language of those interviewed; ability to put people at ease; kindliness; sympathy; efficiency; sense of humor; and ability to answer an infinite variety of questions! Needless to say, the only place you will encounter an individual with all these traits is on the personnel staff of St. Peter! But a company with a sound personnel program will have interviewers with most of these traits.

Most people are nervous when they are interviewed. The personnel man would also probably be nervous if he were looking for a job. So discount this at the first of an interview. The employer usually does, and if he is any good you will find yourself at ease later in the discussion.

What is the employer or personnel man seeking in an engineer? First, in spite of what you may hear in some quarters, personnel administration is definitely not a science. It is merely an orderly, formal way of accomplishing a purpose. Good management in any organization means getting effective results with people. Personnel administration is a code of the ways of placing, organizing,

nd treating individuals at work so that they may each get he greatest possible realization of their own inherent bilities, and obtain maximum efficiency for themselves nd their particular work group, giving to the agency or nterprise of which they are a part a superiority in production and service.

So, placing or hiring people is only the beginning aspect of the personnel man's job—but it is probably the most important and determining one.

Save the bluff for poker

Enough about the man you are going to talk to and back to what he is seeking in you as an engineer; and how he determines that you have what he is looking for. The first factor: have you had sufficient experience and training to meet the demands of the job which is open? The personnel man will examine your application carefully, and will ask you many questions about the nature of your work, the type and size of projects you were on, how many men you supervised, where your supervision came from, what the details of your work consisted of, and a host of other questions to enable him to determine the complexity and level of your past experience.

A word of caution here: do not try to "bluff" or to exaggerate any part of your experience or training. You may get by with it temporarily, but most often not. Remember that the personnel man talks to perhaps two or three thousand people a year and becomes shrewdly discerning in recognizing a false presentation. Also, he is usually surrounded by engineers, and if you should talk about some phase of engineering he is not familiar with, it is a simple matter for him to have you talk to a man who is acquainted with the specialty.

You may be confronted with a written test or tests. If you are, do not be afraid of them. A test is just a more formal and detailed manner of finding out what the interviewer might learn by talking to you. If you are dealing with an established and progressive firm the tests are used with judgment and discretion and are reasonably reliable and valid, or they would not continue to use them. So, if you are competent and qualified, do not worry about a test.

Personality; just be yourself

On the second factor of personality and ability to get along, the personnel man will rely to a certain extent on the interview. As you talk, he will be observing carefully your gestures, appearance, mannerisms, behavior, trend of interest, and attitude toward people, work situations, discipline, and supervision: in brief, trying to fathom your personality. By experience he can determine certain things, but they are general: he can type people, that is whether they are basically introverts or extroverts, slow and easy or quick and spirited, etc. He can usually spot a heavy drinker or one with a serious personality disorder. But the man, personnel or otherwise, who thinks he can get a final and valid evaluation of a candidate's character and personality in an half-hour interview is very much mistaken. Human disposition is still nature's greatest variable. The "shrewd judge of character" at first sight is almost entirely confined to detective fiction.

So, you will find the prospective employer in most cases checking with your previous employers. The personnel man finds that the more he deals with people, the less he comes to rely on his own opinion of a person, and the more he comes to rely on what other people think of him. The larger the number of opinions and the longer the period of time for observation, the more valid the conclusion. There are exceptions, but the best prediction of future work behavior is past work behavior.

On the last factor of the candidate's interest and ability to learn, become more proficient, and advance in the organization, the basic "device" will also be the interview fortified by reports from previous employers. In the interview you perhaps will be asked what you have done to better yourself, such as correspondence or extension courses, why you want to work for the company, where in your career you plan to be in 5, 10, or 15 years, and similar questions.

Most organizations—both public and private—have a probational or trial period for new employees for six months to a year, or sometimes longer, with easy termination procedures if the employee does not work out satisfactorily. This probationary period is considered an actual part of the selection process—whether the initial part be by test or interview, or both—the assumption being that the final and most important test of any candidate is his performance on the job.

So, in summary, what the employer is looking for is a well-adjusted adult human being who is capable of performing engineering work—creatively and with progression.

Efficiency in selection enhances engineering

Engineers should be aware that among good companies (which are the ones you want to work for) employment is no longer a haphazard and slipshod process. One factor stands out in all studies of employment technique: it is becoming increasingly difficult for second-rate people to obtain employment in a well-managed company or agency. Careful investigation is made to weed out undesirable individuals.

This attitude of thoroughness and systematic selection is beneficial. It enhances the prestige of what is now the fully established profession of engineering. If you as an engineer are competent, conscientious and have integrity, you do not have to worry about obtaining and holding a position; nor do you have to be concerned about lack of advancement possibilities in your career. Engineering offers these things to good men.

"Interviews are the most common method of selection . . ."

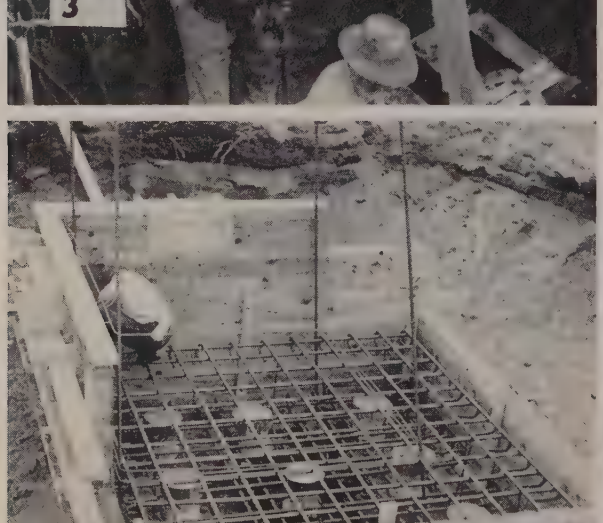
says* Gene Huntley, *personnel director for the Oregon State Highway Department and author of this article. And he has a few suggestions:

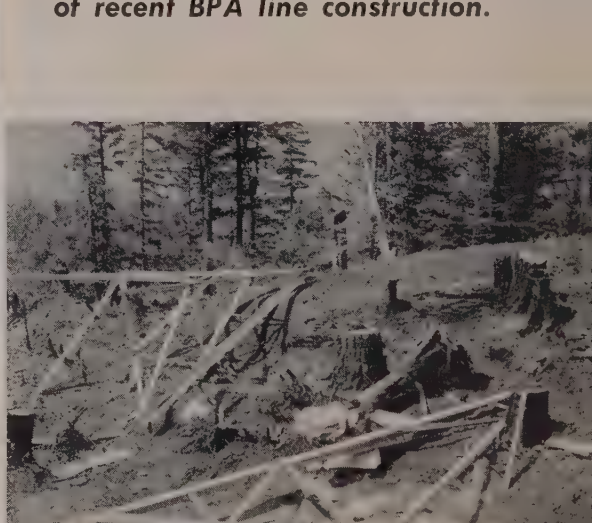
"If you have an appointment, be on time. You can wear field clothes and the personnel man will think nothing of it, but you should look neat. Some employers may not be concerned with your appearance at all; but others may place an undue emphasis upon neatness and other qualities of appearance. So play it safe and do not appear too rugged, even though you are a field man. Have a formal application filled out before you appear, if possible; and if not, at least have a concise outline or description of your experience and training for him to read.

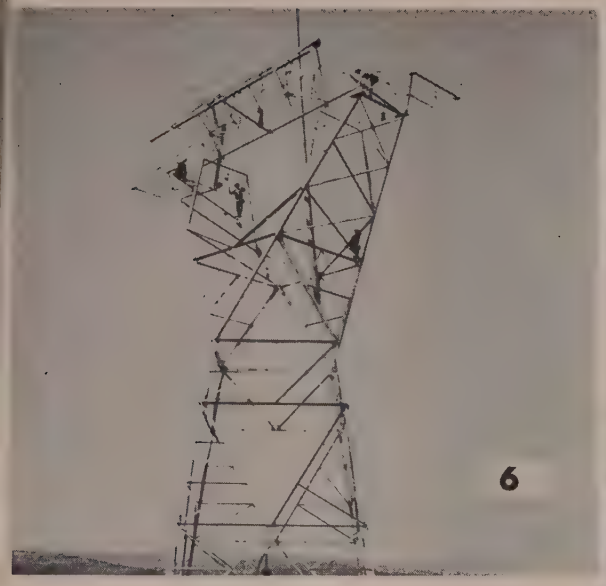
"As soon as possible, relax and be yourself. Be frank and honest in your statements, and answer his questions directly and factually. And do not talk too much. Let him take the lead and you warm up to longer conversation as the interview progresses. More men have talked themselves out of jobs than into them. You should have neither the attitude of fawning and scraping, nor of cockiness. Show confidence, but do not brag. If you have been in trouble with some other employer, discuss it openly. The personnel man is not a tyrant, and if there are other factors in your favor, you still may get a job. At any rate he will probably find out about it later anyway."

Power lines go

Efficient power distribution has spelled the difference on several occasions in the power-hungry Northwest. Continuing development of a power transmission network by the Bonneville Power Administration is illustrated in these photographs showing successive stages of recent BPA line construction.







up in Northwest

RIGHT-OF-WAY (1), slashed through forest, is nearly ready for construction as refuse is piled for burning. Backhoe (2) begins an apparently endless job of tower foundation excavation. Access roads are pushed by contractor to tower sites from main line road, usually on high side of alignment. Grillage footing (3) goes into place and structural work begins. Detail (4) of footing shows 9 supporting timber piles ready for concrete cap. Meanwhile, steel has been dropped off and partially assembled (5) for erection.

ERECTION (6) has been simplified by improved design. This picture of relatively "early" work shows use of gin pole to place center section of cross arm. Outside arm required two other lifts. Nowadays, with lighter towers (7), bigger sections, here an entire crossarm, can be placed from a crane. Gin poles still come into play (8), although their use in a lightweight tower may require special temporary stiffeners in the tower framework. Reels (9) jacked into position mark readiness for the big pull, stringing conductors from the completed towers. Illustrated is the set-up for a double circuit, using two tandem type reel jacks. Details topside remain, including attaching tapered armor rod at connection points below the insulator string (10).

Western AGC chapters learn—

Aid to students pays off

MORE AND MORE, the hard-headed businessmen who make up the membership of the Associated General Contractors' chapters in the eleven Western states and Alaska are finding that it is good business to lend a helping hand to civil engineering students in college. This assistance ranges all the way from helping in the establishment of special construction curricula to donating funds to finance the expansion of civil engineering departments. It includes encouraging student enrollment, sponsoring scholarships for worthy students, furnishing instructors from the industry and hiring students on construction jobs during summer vacations.

Because of this cooperation, construction or contracting engineering is being recognized in educational circles as a distinct field for specialized training either as an option within the civil engineering department or as a separate curriculum of its own, according to Dallas Young, president of the Northern California Chapter. Courses leading to the degree of bachelor of science in construction or to a civil engineering degree with a construction option include studies in estimating, construction methods and equipment, foundations, structural design, accounting, the legal phase of construction, business enterprise, and labor relations. A vital link in this training, Young said, is the summer employment usually offered by chapter members to students between their junior and senior years.

Specific ways in which individual chapters participate can be illustrated by the Wyoming Chapter, which began its program in September 1952. The Wyoming Association advises all high schools in the state about 60 days before the closing of school that engineering scholarships are available for students of high scholastic standards who are in need of financial assistance. Those interested apply to the dean of the department of engineering at the University of Wyoming.

A special committee goes over these applications and rates them according to scholarship, need, and the like. The names of those recommended for approval are then turned over to a vote of the membership at the next meeting. Although no limitations are set in regard to the scholarships, which are worth $250 each, the chapter hopes that a certain number of these engineering students will join the organizations of contractors interested in hiring men with engineering qualifications.

The Wyoming chapter's scholarship awards for 1953-1954 went to 12 students. Four of them, James N. Wood, Rudy L. Burch, James A. Rounds, and Rober S. Casteel, were sponsored by the chapter itself. The other eight were sponsored by individual members of the association. The winners, and their sponsors, are William J. Wempen, Charles M. Smith General Contractor; Wayne Weber, Northwest Engineering Co.; Thomas A. Lockhart, Boatright-Smith; Dale E. Peterson, Read Construction Co.; Donald E. Longwell, Joe McPherson & Lichty Construction Co.; John R. Mobley, Peter Kiewit Sons' Co.; Joseph C. Daly, Inland Construction Co.; and J. H. Clark, Knisely-Moore Co.

Although the Colorado Building Chapter does not participate in scholarship programs in institutions of higher learning, the chapter has been very active in working through the Denver school system. This has resulted in an elaborate training program for supervisory and management employees by means of night classes held over a total period of 24 months.

Learn to supervise

Training includes blueprint reading, specifications and their relationship to the plans, responsibilities of the general contractor, responsibilities of the subcontractor and their relationships to each other, and responsibilities of the subcontractor to architect and owner. The last part of the course includes such management functions as supervision, estimating, quantity surveys, and public liability problems.

The program of the Arizona Chapter has been in operation since 1948. It maintains three annual scholarships of $200 a year each at the University of Arizona in the departments of civil and mechanical engineering. These awards are based on character, promise, and need, as well as scholastic attainment. They have proved a considerable source of satisfaction to both the members of the chapter and to the recipients.

Although the Nevada Chapter has no specific program of assistance, Edward L. Pine, the secretary-manager, is contact member for the ASCE student chapter at the University of Nevada. He meets each month with the students, arranges for speakers, and makes the students aware of summer employment possibilities. Very often a guest speaker will discuss estimating, taking a specific job for which he was awarded the contract, explaining the manner in which he arrived at his figures, and comparing them with other bids submitted.

The Alaska Chapter offers summer employment to students, and in addition the N. F. Shaw Company, a member of the organization, provides scholarships for students in the University of Alaska. This is not a regular engineering school, but it does provide certain technical education in the mining field.

The Colorado Association awards four scholarships each at the University of Colorado and Colorado A&M College. To secure these scholarships,

CONTRACTOR COOPERATION is this scene at the Petaluma, Calif., concrete precasting yard of Ben C. Gerwick, Inc., AGC. Students taking the construction option at the University of California watch precasting of substructure units for the Richmond-San Rafael Bridge being built across upper San Francisco Bay.

udents must have matriculated and tended the civil engineering departents of the respective schools for at ast two years. The scholarships are ranted after two years of work, are f one year's duration, and are given ith the understanding they will be ontinued during the senior year if he students show continued aptitude nd interest in construction work. The chapter feels that award of these scholarships encourages students to nter the construction field upon graduation, but this latter stipulation s not a requirement when the scholarships are awarded. The scholarships, which are worth $250 each, have been awarded since January 1952. They were initiated to interest civil engineering students in heavy and highway construction and to promote better understanding between the engineer and the contractor.

Scholarship winners are offered summer work with either an association member, an engineering organization, or both. After graduation, the student is not obligated to work in the field of construction if he does not choose to do so, although one primary objective of the scholarships is to prepare young engineers, both academically and practically, to enter this field.

The Intermountain Branch sponsors two $250 scholarships, one in the engineering school at the University of Utah and the other at Utah Agricultural College. Each scholarship goes to a senior student for one year. The chapter has two contractors at each school who act in an advisory capacity to the engineering schools. It also sponsors, with the University of Utah engineering school, a four-day highway and engineering conference every March. Employment of engineering students is aided by joint action between the chapter's joint highway committee and the State Road Commission.

No monetary assistance to students in engineering schools is provided by members of the Northern California Chapter. However, the members are very generous in the employment of undergraduates during summer vacations, and they have also availed themselves of many graduates for permanent employment. Also, they have rendered assistance to the various universities and colleges in the area in providing a construction option course for upper classmen in engineering. This gives the student who has had actual experience during the summer on a construction project and who has taken a construction option course a distinct advantage when seeking permanent employment. The University of California, Stanford University, and San Jose State College have been aided by the chapter for many years in the procurement of educational material and assistance in the preparation of engineering curricula. Students and faculty members have taken an active part in AGC activities in the area.

The Central California Chapter has a special advisory committee which aided the University of California in setting up the construction option courses in the engineering school. It also aids in obtaining summer employment.

The Seattle Chapter is investigating the possibility of setting up a superintendent-training course, possibly in cooperation with the University of Washington. This program is still in the exploratory stage and there is no definite information available as yet. This chapter also offers summer employment to students.

A concrete example of how hiring a young civil engineering graduate paid off in a hurry for one contractor was related in a *Western Construction* editorial last June: "... This contractor had been using a standard design for his batch plant footings—an item duplicated a dozen times a year on various projects at a cost of about $5,000 per installation. The young civil engineer redesigned the footing in a day's time, coming up with a new standard that could be applied equally well under all conditions with slight modifications. The cost was halved. That engineer pretty well paid his freight."

More fuel for Montana Power Co.

ANOTHER 80,000-bbl. capacity oil storage tank is being built in the Billings, Mont., F. W. Bird Steam Plant of the Montana Power Co.

Completion of the new tank will provide enough fuel to permit continuous operation of the 66,000-kw. plant for about two months, according to J. E. Corrette, president and general manager of the company. The new tank, which will be 120 ft. in diameter and 40 ft. high, will be erected by the Chicago Bridge and Iron Co.

A steam heating system, consisting of about 3,500 ft. of 2-in. diameter pipe laid horizontally a foot from the floor of the tank, will be installed to keep the oil fluid enough to run. Steam from the plant will be pumped through the pipe to keep the year-around temperature in the tank between 80 and 100 deg. F. A suction steam heater near the outlet will boost the temperature to between 150 and 200 deg. to make the oil flow more freely when the oil is to be removed from the tank.

Oil will be supplied to the new storage tank by an electrically-heated, overhead pipe line from a refinery less than a mile away.

Jemez Dam completed

COMPLETION of Jemez Canyon Dam near Albuquerque, New Mexico, has been announced by Col. Lynn C. Barnes, District Engineer, Corps of Engineers.

The 820-ft.-long, rolled-earth dam, which cost $4,500,000 to build, is 135 ft. high. Opening ceremonies were scheduled for December. Two purposes will be served by the new dam, Col. Barnes said. The first will be flood control protection for Albuquerque by controlling run-off from Jemez Creek into the Rio Grande, and the second will reduce the flow of silt into the Rio Grande. Engineers estimate that in the next 50 years 47,000 acre-feet of silt will be deposited in the Jemez reservoir.

An Indian reservation about 4½ mi. above the dam site is protected from inundation by an earth levee about 2,900 ft. long and about 23 ft. high.

Personnel on the project were Harold A. Murray, chief of the Albuquerque District construction division; Don Wilson, project engineer, and J. A. Coombe, who was in charge of construction of the earth levee at the Indian Reservation.

Eklutna tunnel holed through

A HEAVY BLAST ripped away the final 8-ft. section and signified the holing through of the Eklutna tunnel near Anchorage, Alaska, in the middle of October, bringing in sight the end of more than 2 years work on the 4-mile-long bore. Completion of the project is scheduled for January 1955. For the story of how this tunnel was driven, see *Western Construction*—October 1953, p. 83.

Nevada in water war

NEVADA has announced its intention of entering the long-standing dispute between Arizona and California over allocation of Colorado River water, according to press reports.

Nevada's present allocation is 300,000 acre-feet annually. The state is expected to ask for from 500,000 to 600,000 acre-feet a year when it files its suit before the U. S. Supreme Court.

New freeway plans for Southern California

A NEW freeway east of Santa Ana in Orange County, Calif., is being planned by the State Highway Commission. Plans call for building a 9.2-mi. section of 4-lane, divided expressway with provision for expansion to a 6-lane freeway. The initial cost is estimated at $11,854,000.

HOW IT WAS DONE...

This contractor owns road, rents bridge

WHEN YOU need a bridge in a hurry and only for a short time, why not do what Winston-Johnson contractors did recently—rent one.

Winston-Johnson, currently building Nimbus Dam on the American River near Folsom, California, decided to make concrete on one side of the river and pour it on the other. It would be necessary to have a means of crossing with a capacity of 40 tons to handle the heavy construction vehicles and equipment, and long spans would be essential for rising above the expected winter floods. Because the cost of the bridge had to be charged against the job, it was important to keep the cost low.

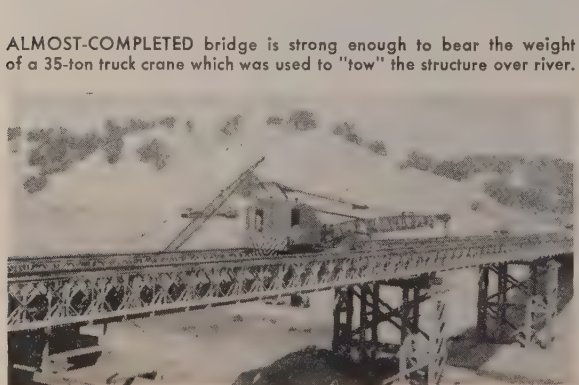
The solution in this case was a 350-ft.-long, triple-single Bailey bridge rented from the Bailey Bridge Equipment Co. A. T. Evans, Winston-Johnson project manager, built concrete footings and heavy timber piers in the river bed to support the superstructure. The piers were spaced to make three spans at 100 ft., and one at 50 ft.

The bridge arrived in pre-fabricated sections. It was assembled in a continuous production line operation on the bank of the river and erected by the cantilever launching method. The 410-ft.-long structure (including a 60-ft.-long launching nose) was rolled across the river as rapidly as sections were completed by the 12-man crew, which completed the superstructure in eight shifts. No difficulty was met in cantilevering the 100 ft. between piers and no falsework was required in the streambed.

Equipment from the project was used to help erect the bridge. A truck crane was parked at one end to hand the bridge parts from stockpiles to the steel crew which pinned the members together. Another crane, on the far bank, used its winch line to tow the structure out over the river on rollers fixed to the pier tops. The 60-ft.-long launching nose was dismantled and removed as soon as it had passed the last pier. The bridge was then jacked up and the rollers were removed and replaced with rocker-type bearings.

The structure has now been in service more than a year and has required practically no maintenance. The timber piers had been ruggedly built and were well secured to generous concrete footings. This, together with the long clear spans of the superstructure, enabled the bridge to withstand a flood which damaged Folsom Dam, 5 mi. upstream, when a cofferdam failed and let go a flow reported at 85,000 sec. ft. (*Western Construction*—March 1953, p. 96; February 1953, p. 92; June 1953, p. 141.)

ALMOST-COMPLETED bridge is strong enough to bear the weight of a 35-ton truck crane which was used to "tow" the structure over river.



SHOOTING HOME a steel pin on the resurfacing job of the Owens Valley Aqueduct is Herb Parker. Claude Drew, foreman, stands by.

Power-driven pins speed aqueduct resurfacing job

TIME was the key word in a job to resurface 6,000 ft. of the Los Angeles Aqueduct, which carries water from Owens Valley near Lone Pine, California. A 135-man crew from the Los Angeles Department of Water and Power was given 18 days to do the job because the continuous 650-ac. ft. flow could not be diverted into Tinnamaha Reservoir longer than that period of time.

Since speed was so important, 2,600 removable wooden forms and 1,800 steel forms were used to pour the job. More than 5,000 steel pins, driven by Ramset Jobmaster powder-actuated tools, were used to anchor the forms. It took 26,000 sacks of cement to resurface the ditch, which was 14 ft. deep and 30 ft. wide.

The bottom section of the ditch, which was 11 ft. wide, was poured at the rate of from 1,000 to 1,400 ft. a day. Removable steel forms, 5, 10, and 15 ft. long, were used for this part of the job. Forms of varying lengths were used because of the curving channel.

None of the forms were pierced by the steel because a moderate powder charge was used which buried 2 in. of the pins in the concrete, leaving 4 in. standing to anchor the forms. This facilitated removal of the forms.

Because the channel sides were poured at an angle of 45 deg., a plastic mix, composed of 60% sand and 40% ¾-in. aggregate, was used. The mix was six sacks of cement per cu. yd. A float finish was used, after which the freshly-poured panels were coated with a wax seal for retention of moisture. The 4-in. layer of concrete was reinforced with 4-in. mesh wire with spacers and with 2-in. cubes of concrete placed at intervals of 18 in.

The work was under the direction of Cecil W. Lewis, Los Angeles Department of Water and Power district superintendent, and Howard Bouey, district foreman.

With CAT* equipment, here's savings in numbers!

As costs rise, it becomes increasingly common to see contractors standardizing on Caterpillar equipment. It's a basic method of fighting inflationary costs.

For instance, the picture shows a Caterpillar D8 Tractor with 8S Bulldozer teamed with a P & H dragline powered by a rugged D375 Diesel Engine. Together they are helping to cut costs on the $77,000,000 Falcon Dam and Power Plant on the lower Rio Grande.

Prime contractor on this international project is Falcon Dam Constructors, a group consisting of: Amis Construction, Massman Construction, Foley Brothers, C. F. Lytle, Edward Peterson, San Ore Construction and Tellepsen Construction.

Like other economy-minded contractors, members of this group take the profit path by standardizing on Caterpillar equipment. They're sure of machines built for a long, productive life, of engines that deliver honest horsepower on No. 2 furnace oil *without fouling*.

But just as important, operators and mechanics become familiar with one make of machinery — enabling them to do their jobs faster and better. Standardizing also reduces parts inventories, particularly since parts are interchangeable on many Cat Engine models.

And, finally, standardization means quick, efficient, *one-stop* service around the clock from *one* source—your Caterpillar Dealer.

So next time specify Caterpillar Engines in the equipment you buy—all leading manufacturers supply them. And when it's time to repower, it's time to see your Caterpillar Dealer.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

SPECIFY CAT POWER FOR HIGH-PROFIT PRODUCTION

HOW IT WAS DONE...

Fastening pipe sections to timber eases underwater installation

LAYING concrete pipe under water on a "mass" installation basis went on recently in Seattle's Lake Washington. McCray Marine Construction Co., Seattle, on a job to place a 500-ft. sewer outlet, discarded the conventional time-consuming method of installing one 4-ft. length of pipe at a time by fastening five lengths to 20-ft. timbers

GETTING A RIDE on a barge (above), pipe is hauled out to site, then dumped into water for installation by diver (below).

with steel strapping. The pipe was then placed on a barge and hauled to the installation site. There, each section was lowered by a winch, guided into place by the diver, and joined to previously positioned sections. This method made the job much easier for the crew and minimized the diver's underwater time. Some sections were placed as much as 40 ft. below the water's surface.

Black top cuts dust on sandy area

TROUBLED with dust on large graded sandy areas? Take a tip from John Bonforte, head of Bonforte Construction Co., who killed his dust problem on a big subdivision at Pueblo, Colo., by black-top paving an 18-acre trouble spot. He sprayed the oil covering on the area under pressure, immediately after grading of the sandy, hilly tract was completed. Inspection showed that the oil has penetrated from ¼ to ½ in., providing a more or less porous protective blanket that helps to hold moisture so that vegetation has the chance to develop.

Bonforte says he has worked on construction projects throughout the West, and that he picked up the idea from the desert country of Arizona and California.

Telescoping sheet metal tremie cuts caisson concrete costs

ON CONSTRUTION of the $40,000,000 Anheuser-Busch brewery building this summer at Los Angeles, the design engineer demanded that concrete should not drop freely more than 6 ft. in the 50-ft. deep caissons with spiral reinforcement. The men of Peck-Cahill Co. began the caisson concrete work by laboriously lifting rubber tremies out of the caissons to detach a 6-ft. section as the level of the concrete came up.

EASILY MOVED from caisson to caisson, tremie is lifted clear by cables from truck's winch.

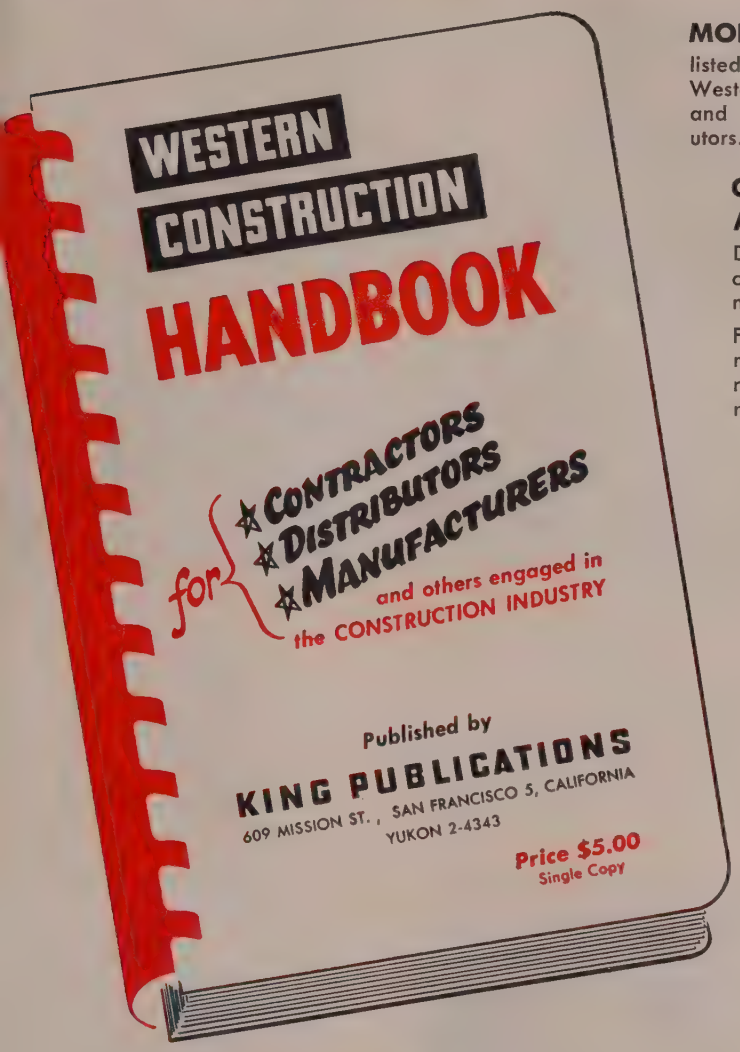
CLOSE-UP of the tremie's four 11-ft. sections telescoped, hopper and tremie head.

Superintendent C. A. McMahon (see his article in Nov. issue) made things considerably easier and less costly for the contractor by designing a telescoping sheet metal tremie. The tremie was made up of four 11-ft. sections of 7-in., 8-in., 9-in., and 10-in. I.D. progressively. This tremie was attached to a hopper, and was rigged to be raised and lowered into the hole by means of three cables attached to the bottom section of the tremie and to the drum of a used war surplus "A"-frame truck.

In operation, the tremie is lowered the full depth into the caisson and the concrete truck starts to unload into the tremie hopper. As the pour progresses, the tremie is telescoped by the cables from the truck's power winch. Thus, the concrete pour for each caisson is continuous and there is no segregation of concrete.

The superintendent's scheme cut the cost of the caisson concrete by about 30 cents per cubic yard, in addition to satisfying the design engineer's requirements.

Can you use this information?



MORE THAN 350 MANUFACTURERS

listed with products manufactured, names of key Western personnel, branch offices with addresses and phone numbers, Western dealers and distributors. More than 150 pages of these listings.

OVER 700 WESTERN DISTRBUTORS AND FACTORY BRANCHES

Distributors listings have names of company officials, location of branches, addresses and phone numbers, and a complete list of lines handled.

Factory Branches listed have addresses, phone numbers, and names of managers. Factory representatives are listed with addresses and phone numbers and names.

COMPLETE ALPHABETICAL PRODUCT LISTING

All products manufactured by those listed are cross-referenced to the manufacturer. Easy to find any manufacturer making any type of construction equipment.

HERE THEY ARE

in the new 1954 Edition of the WESTERN CONSTRUCTION HANDBOOK. The *only* refence that gives you *complete* equipment information on who makes what, and who sells and services it in the West.

This 5th edition will be completely revised and up-to-date to provide the handiest time-saving reference ever published for those who buy, sell, use, repair or maintain construction equipment in the West.

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Construction equipment handbook for Westerners ready next month

WHO MAKES the Trenchliner? . . . Symons crushers? . . . Tiger Brand wire rope?* You'll find the answers to such trade name identification problems in the 1954 edition of the "Western Construction Handbook," now on the press and ready for distribution January 15. The trade names section is entirely new with this fifth edition of the handbook, and is the result of many requests from contractors, distributors and manufacturers who use the reference guide regularly. Generally, the new section will give an alphabetical run-down of equipment names that differ from the manufacturers' own company names.

1954 "Western Construction Handbook" will have almost 100% complete listings of products, manufacturers and Western distributors, plus a section listing trade names

Up-dated and expanded

Addition of the trade names section is not the only significant change for the 1954 edition as compared to the 1953 manual. Most important is the fact that intensive efforts have been made by the *Western Construction* staff, under the direction of Arthur J. Urbain, to make all listings of manufacturers, distributors and construction equipment correct to the last detail and entirely up-to-date at press time. Through its five years of publication, the handbook's listings have been expanded and new information added until the 1954 edition (with more than 350 pages) now will be almost twice the size of the first edition.

Briefly, here is what is contained in the 1954 handbook. (1) A list of construction equipment manufacturers, arranged alphabetically, along with their products, branch offices, key Western personnel, and their distributors in the eleven Western States and Alaska. (2) Distributors in the West and Alaska listed by states and cities, with their addresses, personnel, phone numbers, branch offices, and lines handled. (3) An alphabetical listing of construction equipment and products, with the manufacturers for each. (4) The new trade names identification section. (5) Indexes for the manufacturer and distributor sections to speed reference to these listings.

Who uses it, and how

The handbook is designed as a year-around working tool for contractors and their staffs, distributors, manufacturers, factory branch men, various types of purchasing departments, government agency buyers, salesmen, and anybody else who needs to know the what and where of construction equipment in the West. Some typical uses of the handbook by contractors, for example, are as follows:

A contractor moving on to a job at a new location needs a certain type of equipment, and wants the name of the nearest distributor for that equipment. He checks the manufacturer listing, which gives all of the manufacturer's distributors in the West. He picks the distributor nearest to him, turns to the distributor section, and finds there the address of the distributor, phone number, names, etc. Or a contractor needs a certain type of equipment for a new job in his own backyard. He looks at the products section of the handbook, where it lists all of the manufacturers who make this type of equipment. To compare the different makes, he can check the manufacturer section to locate the nearest distributor for that manufacturer and also the manufacturer's home address and personnel.

Here are some other characteristics of the handbook that add to its usefulness. It is pocket size (4¼ in. wide by 7 in.), and provided with a spiral binding that allows the user to open the book flat at any page. Each section is printed on paper of a different color so there's no confusion as to what section you're in. There is no advertising in the handbook; listings are continuous. A number of blank pages are provided at the end of each section for the user to make notes.

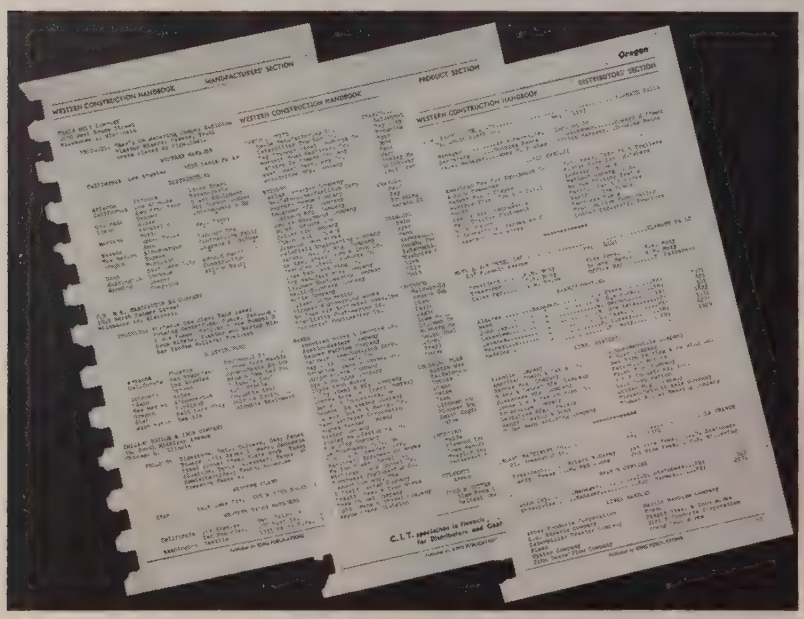
Service for the entire West

The handbook, of course, covers the construction equipment picture for the same area covered by *Western Construction* — the eleven Western States and Alaska. Natural geographic and economic factors, and the operating characteristics of the West's contractors, make this area a separate and distinct region of the U. S. Most Western contractors work on many projects far removed from their home offices. They can—and usually do—operate throughout the West. The editors consider the handbook a valuable supplement to the service provided by the magazine to the "roving" construction men who are its readers, as well as the region's distributors, and manufacturers in the entire U. S.

Although copies of the 1954 edition of the handbook will not be available until January 15, advance orders are now being accepted and delivery will be made within January for these preliminary orders. Price is $5.00 per copy. If you are in a position to use the facts compiled in this reference guide, write to *Western Construction*, 609 Mission Street, San Francisco 5, Calif., indicate how many copies you need (one or more), and enclose a check or money order. Please add 3% for sales tax if ordering from a California address.

*Trade names of The Parsons Co., Nordberg Manufacuring Co., and Columbia-Geneva Steel (Division U. S. Steel Corp.) respectively.

TYPICAL PAGES from the 1953 edition. Left to right: "Manufacturers' Section," which gives manufacturer home office and Western branch addresses, names of Western personnel, products, and Western distributors; "Product Section," listing types of equipment along with manufacturers, and "Distributors' Section," which gives addresses, phone numbers, personnel, lines handled, branches, etc. "Trade Names Section" sample is not shown: this is new with the 1954 edition.



This representative S-A installation includes storage and reclaiming conveyors and a 500-foot storage conveyor with tripper (over storage pile at right). At left is the compartment bin for railroad car loading.

S-A CONVEYING *Systems* for HANDLING—STORING—RECLAIMING... always at lowest cost per ton

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- Stacking Conveyors
- Storage and Reclaiming Systems
- "Natural Frequency" Vibrating Conveyors
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- ZIPPER Conveyor-Elevators
- Conveyor Belt Cleaners
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- Bin Gates and Tunnel Gates
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Whether for stone, ore, gravel or any other material, an S-A Conveying System can help you to achieve low-cost-per-ton operation. Whatever the need—from a simple conveyor to a complete distribution and reclaiming system that includes such functions as screening, crushing, etc.—S-A engineers can design and equip an installation to do the job with maximum efficiency and economy.

They are experienced in providing cost-cutting solutions for practically every kind of bulk handling problem. They work with a complete line of conveying equipment. You are invited to consult them about new or revised bulk handling facilities.

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DESIGNERS AND MANUFACTURERS OF ALL TYPES OF BULK MATERIALS HANDLING EQUIPMENT

Utah tunnel completed

DIVERSION of the north fork of Duchesne River into the Provo River took place when the 6-mi.-long Duchesne tunnel in the Uinta Mountains was completed.

This tunnel, which cost $9,000,000 to build, enables the residents of Salt Lake City to drink water from the Colorado River Basin. The tunnel can handle a flow of up to 600 sec. ft. The Provo River Water Users Association is entitled to divert 50,000 acre-feet of water a year from Duchesne. However, sufficient water will be allowed to continue down the natural course of the river past the diversion point to support fish in the stream, a spokesman for the Association said.

Aids construction men in foreign work

SPECIALISTS and technicians working outside the United States for American contractors have unusual problems. With this in mind, the Construction Men's Association, Inc., is dedicated to helping these workers and cooperating with contractors, government agencies and other groups, the only organization of its kind in this field.

So declares R. D. Heitzman, manager of the West Coast office at 60 Market Street, San Francisco.

"This is a mutual welfare, voluntary membership association now in its tenth year, with more than 11,000 members," said Heitzman. "It is not an employment agency, although it does offer complete and accurate information about jobs open in every project around the world.

"We advise members on rates of pay, living and working conditions, advantages and disadvantages of every project. Exclusive information is provided members through a monthly bulletin to workers, from project manager to journeymen in the various construction trades, not only in foreign countries, but also in Alaska, Hawaii and elsewhere outside the territorial U. S. A.

"James H. Dillon, our president, is in charge of the Construction Men's Association headquarters at 82 Beaver St., New York 5, N. Y. Full information on the nominal initiation and membership fees and services offered may be obtained at either our San Francisco or New York offices," added Heitzman.

ALCAN PROJECT

. . . Continued from page 67

10-hp. hoist and empty cars are raised vertically to permit full cars to pass underneath from the loader and to facilitate spotting empty cars to the loader. When the five cars are loaded one empty car is spotted at the loader, the train moves out and an empty train moves in. One 10-ft. round requires moving 210 cu. yd. solid measure, or 40 to 50 car loads.

A typical shift crew for 16 machines on a jumbo is as follows for the 4 headings.

	Tahtsa-Horetzky	Other 3 headings
Shifters and walkers..	2	2
Miners and helpers....	18	31
Mucking machine operator	1	1
Motormen	4	2
Electricians and mechanics	2	2
	27	38

The work is organized in three 8-hour shifts per day and six days per week. To July 31, 1953, the following progress was made, leaving approximately 10,000 lin. ft. of main power tunnel No. 1 yet to be driven.

Heading	Advance (ft.)	Tunnel sets supporting poor rock
Kemano-Horetzky....	12,627	41
Horetzky-Kemano....	9,641	366
Horetzky-Tahtsa	10,199	272
Tahtsa-Horetzky	10,797	651
	43,264	1,330

Driving records

Besides consistently good advances in the various headings some world records have been broken. In 1949 a record was make by MK crews on a 24-ft. tunnel at Big Creek No. 4 dam in California, advancing 241 ft. in one week. The following weekly records were made by MK tunnel crews on the Alcan Project: One week ending in September 1952, 248 ft.; October 1952, 258 ft.; November 1952, 261 ft.; November 1952, 274 ft.; February 1953, 282 ft. This last record means an average daily advance of 47 ft. The best daily advance was 61 ft.

To meet the stiff schedules laid out it was necessary to organize, train and supervise the tunnel personnel with care and to select, maintain and utilize the equipment carefully. This has been ably handled by R. E. (Whitey) Davis as General Underground Superintendent. V. Bland is superintendent at Horetzky, J. Premo is superintendent at 2,600-ft. level and W. Madaski, master mechanic.

PART 3 of this series will appear in next month's issue. The final two installments will cover transmission line work, construction of the big dam that is reversing the flow of Nechako River, and related construction.

THIS SHOVEL KEEPS TRUCKS ON THE JUMP

The job shown here is an excavation for an addition to St. Benedict's Church, Irving Park and North Bell, Chicago, Ill. You'd call it a tough loading job anywhere you saw it. The material is concrete slab, brick, dirt and miscellaneous rubble from buildings that have been torn down. It's awkward stuff to handle. But Ray Trumbull, Chicago excavator, finds his Cat* No. 6 Shovel keeps five big trucks busy and loads out 800 cubic yards a day.

Mr. Trumbull also owns two Caterpillar HT4 Shovels. He reports: "Our Caterpillar machines stay on the job with low maintenance costs and make our operations very successful."

Watch a No. 6 Shovel at work. Watch it dig in and pick up a good two-yard bucket load. Then time its cycle as it swings to the truck, dumps and returns. You'll see why owners consistently get more production than with other makes of equipment. Every part is built with extra strength, for hard work and long life. Controls are simple to operate.

Ask your Caterpillar Dealer for an on-the-job demonstration. Make him *prove* how these shovels can deliver more yardage, with less down time, at lower cost. Call him today!

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

WESTERN CONSTRUCTION NEWS

DECEMBER 1953

Miller chosen WASHO president

EARLE V. MILLER, Idaho State Highway engineer, was elected president for 1954 of the Western Association of State Highway Officials at the group's 32nd annual conference held at Santa Fe, New Mexico.

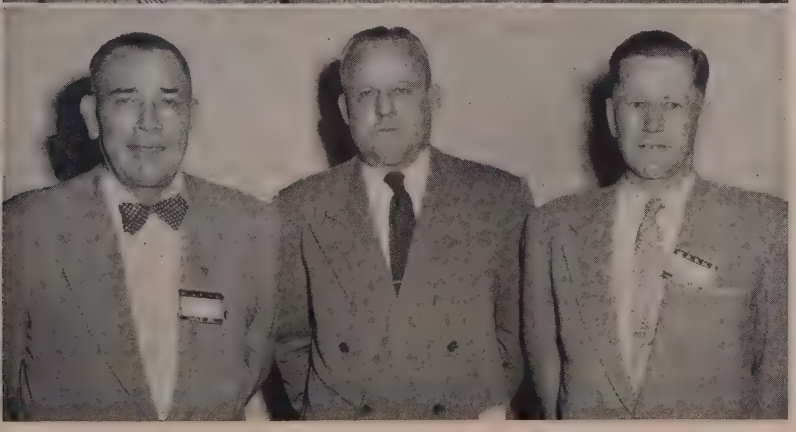
Major speakers at the conference, attended by some 230 delegates from 12 Western states and Alaska, included Al Hale, executive secretary of the American Association of State Highway Officials; Representative John J. Dempsey of New Mexico; H. M. Shank, assistant regional forester; Mark U. Watrous, Colorado highway engineer; R. H. Baldock, Oregon highway engineer; and I. O. Jahlstrom, California bridge engineer.

Hale predicted that Congress would vote substantial increases in federal aid money for highway building next spring. He does not expect any drastic change in the present procedure of allocating federal aid highway funds among the states and he does not expect a repeal of the federal gasoline tax.

Watrous, former president of the association, said the proposal for a transcontinental toll road is gathering some momentum. He warned delegates not to be pressured into starting such a venture until and unless the engineering and economic feasibility of such a proposal has been ascertained. Watrous urged his fellow engineers to speak plainly about highway problems. He pointed out that in the past when highway departments sought to increase trucking fees or gasoline taxes, highway departments immediately became the target for insidious propaganda and abuse.

Baldock, in discussing highway financing, said the federal government should pay part of the cost and the rest should be paid by local government so arranged that the beneficiaries of the roads and streets pay in proportion to the benefits received.

WASHO'S officers for 1954 are (top row from left) *C. O. Erwin*, chief highway engineer of New Mexico, vice president; *Earle V. Miller*, Idaho state highway engineer, president; and *W. E. Willey*, engineer of economics and statistics for Arizona, secretary-treasurer. Executive committee members are (bottom row from left) *W. C. Williams*, Oregon's first assistant state highway engineer; *William A. Bugge*, Washington's director of highways; and *D. C. Greer*, state highway engineer of Texas.



Wyoming adopts new bid information procedures

WYOMING'S highway department has conducted a survey among the states concerning practices in the release of lists of plan holders before bids on the proposed work are received.

After a study of the various methods used, Wyoming has prescribed the following practices, which it considers fair to all concerned:

Two weeks before a scheduled bid opening date, a list of all projects included in the letting will be posted on a public bulletin board in the main office of the Wyoming Highway Department. Sufficient space will be allowed under each project to list the names of contractors who take out plans for that project. Any contractor who wishes to list his name in the space provided may do so, but the listing must not be made by an employee of the State Highway Department, and in no case will the name of any plan holder, listed or not listed, be released by a Department employee.

Of the 43 states which sent replies to the Wyoming survey, 29 release the names of plan holders by various methods before the date of the bid openings, while 14 do not.

Of the 29 states which release the information, 15 release the names publicly and 14 release them privately.

Although 29 states release the names of plan holders before the dates of bid openings, only 23 approve of the practice. Many of these states approve only when information is going to material suppliers at their direct request.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

BIG QUESTION MARK—Should the mammoth dam proposed for Swan Lake near Ketchikan be of concrete or rock-fill construction? This question has construction engineers scratching their heads. The project will supply power for the city of Ketchikan with an eventual output sufficient to supply the needs of pulp manufacturers in the Ketchikan area. If a rock-fill substitute is decided on as an economy measure, a concrete core would still be required. Engineers are considering another complicating factor—Swan Lake is in an earthquake area and any dam constructed there would be subjected to sudden, tremendous pressures.

SCHOOL PLANNED—A new college for Alaska is planned by the Methodist Board of Missions, but so far no location has been decided upon. Various sites have been inspected in the territory, including locations at Anchorage, Palmer and Fairbanks.

CONCRETE PROBLEM — Contractors in Alaska will have to look for a new supply arrangement after Dec. 31. The Corps of Engineers has announced that the government will not supply ready-mixed concrete to defense construction projects after that date. The present contract between the government and Ashback & Craig Co. for furnishing the concrete expires at the end of the year. The plant operated by Ashback & Craig is located at Elmendorf air base and supplies concrete to projects on the base and Fort Richardson. Similar plants are located at Ladd and Eielson air force bases; however, contracts there will not expire until late in 1954. When defense construction projects were initiated in Alaska, concrete supply in the territory was a major problem. Suppliers in Anchorage and Fairbanks were not then equipped to meet the volume required for defense construction, but local facilities now are capable of supplying the demand.

TERMINATION DUST — Otherwise known as snow—has brought about a sharp decline in construction employment in Alaska and a big tightening up of payrolls on scores of projects where some inside work is still progressing. Officials at the customs station at Tok Junction have reported that an average of 20 cars a day are leaving Alaska for the States over the Alaska Highway, with only about 10 or 12 cars arriving in the territory each day. The advent of subzero weather has brought to an end most of the projects where excavation, dirt-moving, and outside work is required. The bulk of the work now is in the form of inside framing, as well as installation of necessary utilities.

SOME JOBS AHEAD — Sixty-six Army, Air Force, and Alaska Communications System projects are slated for Alaska between the end of November and the end of June next year. These include an Arctic Training Center at Big Delta, where installations will be built using a $35,000,000 over-all appropriation for Ladd Field, Eielson and Big Delta—all defense centers in the Fairbanks area. At the present time, a total of over $200,000,000 in projects is in various stages of completion.

IN THE BALANCE—Only $78,000,000 in authorized defense construction for Alaska remains to be advertised and awarded during the remainder of the present fiscal year, which ends June 30, 1954. Col. Carl Y. Farrell, acting Alaska district engineer, says the planned construction program includes projects in the 1954 fiscal year construction program amounting to over $22,000,000. In addition, more than $10,000,000 in projects are yet to be allocated from earlier programs.

COST STATISTICS recently released show that $660,319,877 in construction was completed during the years 1947-1952, with the Corps of Engineers in charge of the lion's share of this work—$399,831,162. Other agencies whose expenditures were heavy in Alaska during the five-year period include the Alaska Road Commission ($58,635,943), the Bureau of Reclamation ($44,645,821), and the Alaska Railroad ($44,000,368).

POOR CONSTRUCTION HOUSEKEEPING—Slipshod housekeeping on construction jobs in Alaska has been criticized by Andrew Schmitz, Department of Labor safety consultant. Schmitz, who said this was leading to an unnecessarily high accident rate, urged that supervisors integrate safety orientation in job instruction. M. F. Alewine, business agent for the Operating Engineers union in Anchorage, blamed most construction accidents in Alaska on the "lack of qualified and trained supervisors." Alewine rejected lack of money as an excuse for failure to provide safety instruction and trained personnel, arguing that a safe operation is ultimately also a profitable one. The discussions were held at a get-together of military and civilian authorities for the purpose of improving safety conditions on construction jobs.

MAJOR ALASKAN CITIES are now giving much attention to slum clearance work. The Federal Housing and Home Finance Administration has received authorization for a study of slum clearance in Fairbanks, and the matter is receiving attention on the part of city planners in Anchorage. The FHHFA study does not necessarily commit the city of Fairbanks to undertake reconstruction of blighted slum areas. The study will merely provide the city with data concerning the ways and means of doing the job. After the economic and structural feasibility is outlined the council will then be faced with a vote on the project. Much of the early Alaska construction was of the shack type, but such structures are rapidly being replaced by modern stateside-type homes and buildings.

BIG CELEBRATION was touched off with completion of the Eklutna tunnel near Anchorage. Palmer Constructors, the contractors, threw a huge party for construction workers engaged in pushing through the 4½-mi. tunnel which will carry waters of a mountain lake to a lower-level powerhouse. The tunnel is 9 ft. in diameter and was within less than ½ in. of alignment as crews broke through near the center point late in October. The tunnel is part of a Bureau of Reclamation hydroelectric project which will serve Anchorage.

CONSTRUCTION NEWS CAPSULES—A $1,000,000 housing project is now under construction in Seward with Walter J. Hickel of Anchorage the builder . . . The entire territory is scheduled to benefit from allocation of $12,000,000 recently for Alaska Public Works construction projects . . . Fairbanks will get a sewage trunk line and lift station, and water system, and Anchorage will get $1,102,000 for construction and equipping of a 22-room concrete school . . . Delivery of six new TD-24 International tractors with dozers to Morrison-Knudsen is expediting work on the Richardson Highway. The tractors, among the biggest manufactured, were delivered through the seaport of Valdez and are being used to pull 22-yd. scrapers in moving dirt. . . . The Alaska Employment Security Commission has reported that large numbers of workers are "chiseling" on the territory's unemployment compensation fund while wintering in the states . . . The biggest hospital in Alaska, the Alaska Native Service hospital, was scheduled to open after Dec. 1 to receive some of the 2,000 tuberculous Alaskan natives now on waiting lists throughout the territory . . .

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The importance in an industrial installation of a water supply line for fire protection cannot be minimized. And "Century" pipe offers a distinct advantage.

No need for concern that one day as a result of tuberculation, the line will carry less water and be inadequate to meet an emergency. That cannot happen with "Century" pipe. The bore retains its original diameter and smoothness—a very real advantage for any pipe intended for water supply.

"Mains Without Maintenance" is an informative booklet of real value to anyone concerned with water mains. Write for it.

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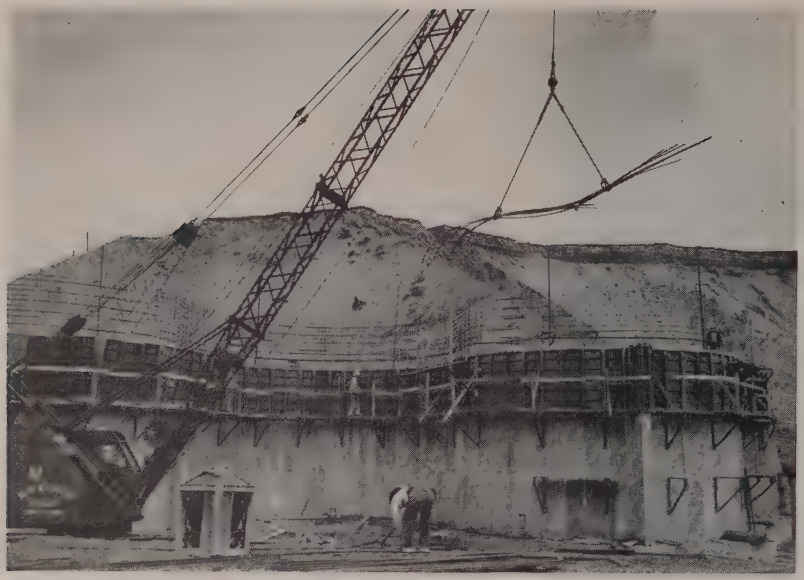

THIS CURVED wall will hold various sizes of sand and gravel in the bunkers formed by its 15½-ft. radius curves. The wall is 40 ft. high.

Sand bunkers built in S-shaped curves

SPECIALLY-DESIGNED forms were used by the Butler Construction & Engineering Co. in building two sand and gravel storage walls and bunkers on a $542,000 contract.

The project involves two separate structures. In each case the unusual feature is the design of the walls, which in plan very nearly follow a sine curve. The walls are 40 ft. high and 15 in. thick, laid out on a radius of 15½ ft. The inside of each curve serves as the backwall of the sand or gravel bunker, with straight wall sections projecting like spokes to give added storage capacity. One series of bunkers, to store 6 gravel fractions and 2 of crushed rock, is 400 ft. long. The other, handling 5 sand classifications, is 190 ft. long.

Reason for the novel design was to gain economy in footings by making the walls themselves more stable. Only additional support against the lateral force of their contents (at a maximum when a full bunker is next to an empty one) is provided by the structural steel bridging that extends down the line and supports the charging conveyors.

This system of conveyors is used to fill the bunkers from the top while an 8-ft. diameter reclaiming tunnel carries a 36-in. conveyor belt under the bunkers in a surge-type operation. Both the sand and gravel storage sections are sized to accommodate 2,000 tons of live storage in each compartment. The total storage in any one compartment is variable, however, depending upon the amount of material which may be spread out by a tractor.

The job was designed and engineered by Kaiser Engineers for the Glacier Sand & Gravel Company of Steilacoom, Washington. The forms were designed and manufactured by Concrete Forms, Inc. The reinforcing steel came from Bethlehem Pacific. Robert J. McCarthy was job superintendent. W. B. Ball was project engineer for Kaiser.

Everett tunnel lining job is completed

NOVEMBER 2 marked completion by Kemper Construction Co. and H. W. Hongola & Son of lining operations in a tunnel of the Everett, Washington, water supply system. Earlier work and general procedures on the contract were reviewed in an article in *Western Construction* last July. This was the stop-and-go job where lining had to be done in three stages with periodic interruptions required to replenish storage between the tunnel and the city of Everett.

First work was performed in a 28-day period during September and October of 1952. Later work was carried on between March 9 and April 22 of this year. The contractor resumed work on September 28, 1953, with 1,782 ft. of concrete lining remaining of an original total of about 6,400 ft.

During the following 15 days the arch and wall work was completed, and the remaining time until October 29 was used to pave the entire 6,422-ft. length of invert. Water was turned into the tunnel again on November 2.

Total concrete used on the job (6-in. lining all around) was 8,713 cu. yd., including 5,503 yd. for filling overbreak. An interesting note is that the overbreak concrete ran about 30% in excess of measurements taken when the tunnel was originally driven 22 years ago. The excess is attributed to raveling during this period of service in an unlined condition.

Final contract cost came to $618,200 without sales tax, or about $96 per lin. ft., according to F. S. Zeidlhack, engineer for John W. Cunningham & Associates, consultants on the work.

Salt Lake City gets OK to build power plant

AUTHORIZATION to construct a $1,000,000 power plant at Deer Creek Dam near Salt Lake City has been given by the Department of Interior The authorization was given in a letter sent to the Provo River Water Users Association by Fred G. Aandahl, assistant secretary for water and power development.

The letter specified that the new plant would have to be built under acceptable plans and specifications and in keeping with the water supply and the design and operation of the present dam and outlet works. The Association will also have to adopt a plan for financing the operation of the plant and disposal of surplus energy in a manner that will result in a credit on the construction costs comparable to those that would result from construction of the plant by the Bureau of Reclamation.

One of the better known plans for construction of the Deer Creek power plant would be for it to be built by the Utah Power & Light Co. and then leased by the Association to the power company for 50 years. The private utility would then guarantee the Association a minimum return for the power of $40,000 per year. At the end of 50 years the Association could renew the lease or make other arrangements to operate the plant.

Cajalco Tunnel is holed through

MORE WATER from the Colorado River has been made available to Southern California with completion of excavation on the 1½-mi.-long Cajalco tunnel from Lake Mathews, near Riverside.

The tunnel, which is 10 ft. in diameter and which will have a capacity of 500,000 gal. of water per day, was holed through in 14 months by the Shea Co., the contractor. The contract price was $1,598,800.

The tunnel, which is part of an 18-mi. feeder line, brings the total length of tunnels on the main aqueduct system to 111 mi. The present system, which is the longest and largest domestic water supply system in the world, totals 457 mi.

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Northwest firm to survey Lewis River power sites

PRELIMINARY permits have been given by the Federal Power Commission to Pacific Power & Light Co. to survey sites for two proposed hydroelectric projects on the Lewis River in Skamania and Clark counties in Washington.

If completed as proposed, the projects would cost between $40,000,000 and $50,000,000, according to Paul B. McKee, president of the company. One of the projects would be construction of a spillway-equipped, rock-fill dam about 225 ft. high at either Devil's Backbone or Big Bottom dam site, 16 mi. upstream from Yale dam. The development would include a 122,000-acre-foot reservoir, an 18,000-ft. power tunnel, a surge tank and two penstocks, and a powerhouse to produce approximately 50,000 kw.

The second project would be another rock-fill dam about 200 ft. high, forming a reservoir with storage of about 100,000 acre-feet, located about 11 mi. upstream from the first proposed project. The second project would include a 16,000-ft. power tunnel, a surge tank and two penstocks, and a powerhouse generating approximately 35,000 kw.

The project would include additional generator units at Yale and Merwin dams.

Wyoming finishes roads

COMPLETION of 5 road jobs and an overhead crossing by the Wyoming State Highway Department has been announced by J. R. Bromley, State Highway Superintendent. The overpass work included ¼ mi. of approaches and two steel spans, each 52 ft. long, an 84-ft. span and a 74-ft. span in Cheyenne.

The road work included almost 40 mi. of grading, draining, base course surfacing, plant-mix surfacing, oiling, and seal coating on federal and state highways all over the State of Wyoming.

Oregon bridge bonds sold

UMATILLA COUNTY, Ore., has sold almost $4,500,000 worth of bonds to pay for construction of a bridge across the Columbia River between the city of Umatilla and Paterson, Wash. A time limit of 18 months has been set for completion, but contractors expect to finish the bridge in about a year.

Salem bridge completed

SALEM, Oregon, has opened its new Marion Street bridge across the Willamette River.

'. G. & E. pipeline crews verage 400 ft. per hr.

RENCHING machines and leap-ogging welding crews of Pacific Gas : Electric Co. are speeding comple-.on of an 88-mi. natural gas line in he San Joaquin Valley of California t an average rate of more than 400 t. per hr. The pipe, which is 34 in. in liameter and comes in sections 64 ft. ong, is part of a 220-mi. line of new oops being laid parallel to the com-)any's original Super Inch line. The iew project will add another 150,000,-)00 cu. ft. daily to the Super Inch's)resent 550,000,000-cu. ft. daily ca-)acity.

Super Inch is the world's largest diameter, long-distance, high pressure natural gas line. It begins on the Colorado River near Topock, Ariz., and ends at Milpitas on San Francisco Bay.

Power output doubled

POWER OUTPUT of the Public Service Co.'s new Person Station in Albuquerque, New Mex., was doubled when the second section generating 20,000 kw. was finished.

Future plans include construction of a third and fourth section, each generating 30,000 kw., to be finished in about two years. The whole plant will then represent an investment of about $16,000,000.

25-story building started

DOWNTOWN San Francisco began resounding with the roar of construction equipment when work began on the Equitable Life Assurance Society's new 25-story building. The structure, which will have about 360,000 sq. ft. of floor space, is being built by the Dinwiddie Construction Co. under an $11,000,000 contract. It was designed by Architect Wilbur Peugh.

Hungry Horse power flows

POWER has begun flowing from Hungry Horse Dam in northwestern Montana, according to M. R. Wood, Bonneville Power Administration manager for Montana. The dam, which has been under construction since 1948, has a current generating capacity of 140,000 kw. For the story of how the penstocks were constructed, see *Western Construction*—May 1951, p. 79.

U. S. 99 skips Gold Hill

GOLD HILL, Ore., has been bypassed by a new 5-mile-long section of U. S. Highway 99, which was opened to traffic recently.

"this NEW Cedarapids SUPER

is the star performe

HERE'S the Cedarapids Super Tandem Gravel Plant *newly engineered* for star performance on jobs where gradation of a big volume of material is the most important of the plant operations. The Super Tandem is now built with a 48″ x 12′ Horizontal Vibrating Screen to give you the really high screening capacity that is a big advantage in any pit and is especially profitable where there's a high percentage of fines or contaminated material. Other Super Tandem features, like the 1036 jaw crusher, 2416 roll crusher and 30″ wide conveyors, are engineered to handle this extra capacity with no increase in operating or maintenance costs. See your Cedarapids distributor for complete details.

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TANDEM

r our jobs"

Say the Place Brothers of Scranton, Iowa

"we're getting 100% more screening . . . 25% more conveyor than the Junior Tandem we operated . . . 228 to 310 tons per hour . . . steady operation day in and day out . . . very low maintenance . . . THAT'S PROFITABLE PERFORMANCE!"

Burl Place (left) and LeRoy Place are producing ¾" minus crushed gravel to the tune of a 228-ton per hour average . . . with peak production hitting 3560 tons in an 11½-hour day! Average per cent of crush was 20% with portions of the material wet, with some clay. Burl Place says, "This new Super Tandem is very trouble-free and dependable. We can plan on operating at full 11½-hour day every day, weather permitting, and maintaining the high average production that keeps us ahead of our competition."

"OUTSCREENS ANY OTHER SCREEN I'VE EVER SEEN," says LeRoy Place

"That big 48" x 12' horizontal screen is a humdinger for the kind of work we do . . . processing semi-wet material with a high percent of fines. For capacity alone, it outscreens any screen I've seen operate, and by reducing the circulating load, we have less wear on the crushers. Add the screen's trouble-free operation and the result is the extremely low maintenance, high capacity machine we need to operate a successful business in tough competition. Our maintenance cost runs less than ¾ of a cent per yard."

HIGH FLEXIBILITY

The Super Tandem is designed to handle a wide range of crushing and screening conditions. Optional equipment which increases flexibility includes swivel feed conveyor, spray bar attachments and sand ejector screw. Cedarapids Primary Crushing Unit used ahead of the Super Tandem converts it into a high capacity rock plant. "Packaged" Super Tandem separate units are available for stationary operation.

30" WIDE CONVEYORS

As part of the new-design efficiency of the Super Tandem, the width of the delivery conveyors, plant conveyor and under crusher conveyor has been increased to 30" to handle the greater production of the plant.

The newly engineered Super Tandem is designed specifically to meet conditions where extra-high screening capacities are necessary . . . but *remember* . . .

THERE'S A CEDARAPIDS PLANT TO HANDLE EVERY JOB!

The Master Tandem or Unitized Plant for the biggest jobs, the Commander Plant for high output of fine-crushed products, the Rock-It for producing roadstone and aglime, the Junior Tandem and Pitmaster for smaller jobs, the Cedarapids Single Pass Plant for low-cost road maintenance . . . a size and type to fit every job and every pocketbook.

FOR BITUMINOUS MIXING, the big Cedarapids Model E is ready for profitable big-job production, or the Master Plant, Model FA or Model PM Commercial Size Plant are available to meet any quantity, any specification requirement.

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Cedar Rapids, Iowa, U.S.A.

ENGINEERS ON THE MOVE

W. (Bill) V. Johnston, until recently working at the Savannah River Plant for E. I. duPont at this company's Savannah River plant, has returned to the West and is resident engineer at the steam power plant being constructed at Morro Bay, Calif., by Pacific Gas & Electric Co.

Fred Gloor, county engineer of Clark County, Wash., resigned the post as of Nov. 1. Prior to his county position, he had been with the Washington State Highway Department for 30 years.

Emory Wilson Lane, formerly a research engineer with the USBR at Denver, has accepted an appointment as a civil engineering professor at Colorado A. & M., on a temporary basis.

Colonel George H. Walker has been appointed as District Engineer of the San Francisco District, Corps of Engineers. He has been Acting District Engineer since August, prior to which he served for over a year as Executive Officer of the District. He is one of the youngest district engineers in the entire Corps of Engineers organization, and, at 39, is the youngest officer ever to be appointed as San Francisco District Engineer, a post that has been in existence well over fifty years.

Carl Rambow, a graduate of Cal Tech last June, is the winner of the nation-wide student prize of the 1953 Daniel W. Mead Contest. He was a finalist from the Los Angeles Section, American Society of Civil Engineers. The winning paper was entitled "Why it should be considered unprofessional to use the advantages of a salaried position to compete with engineers in private practice."

Col. George E. Picketts succeeds **Lt. Col. L. L. Rall** as executive officer of the Seattle District, Corps of Engineers. Colonel Rall becomes military assistant to **Col. N. A. Matthias,** district engineer.

J. Rich Steers, New York, and **Glenway W. Maxon,** Dayton, Ohio, on Nov. 4 were chosen as the 1954 recipients of the awards given annually by The Moles for "outstanding achievement in construction." The Moles is a society of leading figures in the heavy construction industry and the award, which will be presented to the winners next February, is considered the highest recognition that can be accorded service in the American construction field.

LOOKING OVER the steel framework of the new Schlitz Brewing Co. building in San Fernando Valley, California, are (from left) *G. E. Brandow*, consulting engineer; *R. W. Binder*, chief engineer for Bethlehem Pacific Coast Steel Corp.; *E. T. King*, of the architect's firm; and *G. E. Morris*, superintendent of buildings in the Department of Building and Safety of the City of Los Angeles.

AN EXHAUSTIVE reference work to serve as a standard international handbook on rock blasting has been published by Aktiebolaget Atlas Diesel and Sandvikens Jernverks Aktiebolag, Stockholm, Sweden. Described as the first complete treatise dealing with the scientific, technical and practical aspects of rock blasting in mining, tunneling and excavating, it is based on a wealth of information obtained from projects in many countries, as well as from blasting research carried on for many years. Main textual divisions take up rock blasting methods; planning and practical results; compressed air supply; drill steels; explosives, charging and drilling; ventilation; terminology; and geology. This loose-leaf reference is available only to recognized members of the civil engineering and mining professions. Orders on your letterhead can be placed with the nearest associate company of Atlas-Diesel, Copco Pacific, Ltd., 930 Brittan Ave., San Carlos, Calif. Price is $15.00.

Marcus D. Hodges, until recently an employee of the Corps of Engineers, has accepted a position in the sanitation department of the Seattle city engineer's office.

Woodward, Clyde & Associates, soil and foundation engineers, Oakland, Calif., recently announced the addition of **Raymond Lundgren** and **Merrill R. Neumann** as partners.

The following officers for 1953 were named at the recent convention of the Structural Engineers Association of California held at Yosemite National Park: President, **Harold P. King,** SEAOSC; vice-president, **Merle A. Ewing,** SEAOCC, and secretary-treasurer, **Joseph Sheffet.**

Edwin W. James, chief of the Inter-American Regional Office of the Bureau of Public Roads retired on Oct. 31. He had been with the BPR since 1910, serving successively as chief of road maintenance, general inspector, assistant chief engineer, chief of the division of design and chief of the division of highway transport, before

coming head of the Inter-American gional office.

* * *

John Bliss, for the past seven years ate engineer of New Mexico, has signed effective Nov. 15. He started ork with the department in 1926, rogressing through various assign- ients from instrument work up hrough assistant state engineer. He ill be succeeded as state engineer by ohn Erickson.

* * *

Arthur J. Power, Denver, USBR anal design expert, has joined other Bureau engineers with the Foreign Operations Administration, working on the development of land and water resources in Israel.

* * *

A. M. Rawn, chief engineer and general manager, Los Angeles County Sanitation Districts, has been elected chairman of the California State Water Pollution Control Board, succeeding **General Warren T. Hannum.** On the 14-member board, Rawn represents the field of public sewage disposal.

DEATHS

S. S. Leonard, well known Bureau of Reclamation engineer at Friant, Calif., died recently.

* * *

E. J. Franklin, 81, retired engineer with the Utah Copper Co., died Oct. 3 at his home in Encino, Calif.

* * *

Donald Powers, 47, an equipment operator for Eaton & Smith on a road job near Yreka, Calif., shot himself on Oct. 6.

* * *

William T. Backstrom, 49, partner in the contracting firm of B. & R. Construction Co., San Francisco, died Oct. 21.

* * *

Charles O. Brittain, 74, civil engineer, died on Oct. 2 at his home in Los Angeles.

* * *

Ross L. Calfee, a civil and consulting engineer of Berkeley, Calif., died recently.

* * *

Hugh Murdock Smyth, 67, building contractor of Paradise, Calif., died Oct. 4.

* * *

J. Herbert Davies, 51, consulting engineer of Long Beach, Calif., died Oct. 7, after a week's illness. He was a member of the Los Angeles County Regional Planning Commission.

SUPERVISING THE JOBS

Walter White, superintendent, is in charge of a $305,055 job for the Tangmo Construction Co., who holds a subcontract for laterals and drainage work at Lombard and Toston canals, Toston, Wyo.

* * *

Lyle Folkins is supervising the construction of a men's residence hall at Montana State College, Bozeman, for Roy E. Thompson Construction Co. **Maurice L. Holets** is steel superintendent, and **Alfred Abelin** and **Chas. Gallup** are carpenter foremen. This 4-story and basement reinforced concrete building is being erected at a cost of $1,200,000.

* * *

Martin Cornelius and his assistant **Rubin Sell** are directing the bridge work at Dunsmuir, Calif., for the con-

Martin Cornelius

tractor, Charles MacClosky Co. Work on this reinforced concrete arch is expected to be finished in November 1954.

* * *

R. W. Stalwick is job engineer for Bechtel Corporation on the erection of a 100,000-kw. addition to the existing steam power plant being built for the Utah Power & Light Co. at Salt Lake City. Stalwick was formerly job engineer for the PG&E steam plant at Pittsburg, Calif.

* * *

R. E. Robinson is general superintendent and **D. O. Davidson** is his assistant on the erection of a chemical plant at Garfield, Utah, being built for Western Phosphates by Stauffer Chemical Co. The following key personnel are working at the site: Foremen—**K. R. Mecham**, general pipe; **R. N. Stirland, A. J. Crapo**, and **C. L. Lindquist**, millwright; **M. W. Young, J. R. Thorn** and **R. E. Kemp**, pipefitter; **G. J. Thomas**, labor; **E. Walters**, paint; and **J. W. Hunt**, carpenter. **C. W. Harrison** is draftsman, and **R. L. Cole** is in charge of the office.

Charles P. Jarman is doing the steel erection work under a subcontract. **Harold W. Barnes** is job superintendent on this rigging, detail and fabrication job, assisted by foremen **William C. Peterson** and **Fay Walton.**

On another subcontract for structural steel erection and fabrication, held by Herrick Iron Works, **A. W. Markgraf** is general superintendent and **Ed Ruben** and **Herb Clark** are foremen.

* * *

Wally Christiansen as general superintendent and **Simon Christiansen** acting as assistant superintendent, head up the construction of $1,600,000 school building facilities at Sandy, Utah. Working for Christiansen Bros., who hold the contract, are the following foremen: **William E. Dahle**, ironworker; **Merlin B. White**, labor, and **John de Jong**, cement finisher.

* * *

Harry Benner and **W. C. McKinley**, his assistant, are superintending a $15,000,000 contract of the Bechtel Corporation at Salt Lake City where additions to the Gadsby steam power plant are being built by the Utah Power & Light Co. Foremen are: **Floyd Roberson**, general steel; **Pete Nielson**, structural; **Jack Roberson**, reinforcing; **Eldon Webb**, general carpenter; **Fred Officer**, labor; **Les Witherol**, electrical, and **Elmer Daugherty**, rigger. **Roy Stalwick** is job engineer.

Wayne F. Lott is job superintendent for Cannon Construction Co., subcontractor on the warehouse and construction office.

* * *

Additional supervising personnel (*Western Construction*—Sept. 1953) on the Macco-Puget Sound $8,000,000 concrete dam No. 2 on So. Boulder Creek being constructed for the City of Denver, working under the supervision of **O. H. Tucker** and **Fred D. Hudkins**, are the following: Superintendents—**Charles R. Seaton**, elec-

cal; **Kenneth J. Hayes**, haul, and lph I. **Ross**, shift. Also, **Elvin A. ickson**, master mechanic; **Marvin Moore** and **John C. McGee**, general foremen. **James L. Wilton** is gen-

CALENDAR OF MEETINGS

Jan. 5-7—American Road Builders' Association, annual meeting, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

Jan. 8—Oregon Section, ASCE, annual meeting.

Jan. 8-9—Intermountain Branch, AGC, annual convention, at Hotel Utah, Salt Lake City.

Jan. 8-9 — Montana Contractors' Association, Inc., and **Montana Building Chapter, AGC,** joint annual meeting, at Northern Hotel, Billings.

Jan. 13-14 — Portland Chapter AGC, annual meeting, at Multnomah Hotel, Portland.

Jan. 14—San Diego Chapter, AGC, annual meeting, at El Cortez Hotel, San Diego.

Jan. 15—Mountain Pacific Chapter, AGC, annual membership meeting.

Jan. 22-23—Colorado Contractors Association, Inc., AGC., annual convention, at Shirley-Savoy Hotel, Denver.

Jan. 29—Central California Chapter, AGC, annual meeting, at Hotel Mark Hopkins, San Francisco.

Jan. 31-Feb. 4—Associated Equipment Distributors, national convention, at Waldorf and Barclay hotels, New York City.

Feb. 22-25 — American Concrete Institute, 50th annual convention, at Shirley-Savoy Hotel, Denver, Colorado.

Feb. 25-27 — American Concrete Pipe Association, 46th annual convention and meeting, at Fairmont Hotel, San Francisco.

March 1-4—Associated General Contractors, 35th annual convention at Statler Hotel, Los Angeles.

Apr. 28-May 1—Pacific Southwest Local Sections, ASCE, conference, at Sacramento, Calif.

May 27-29—California Society of Professional Engineers, annual convention and trade show, at Mark Hopkins Hotel, San Francisco.

Oct. 14-16—Structural Engineers Association of California, annual convention at Hotel Del Coronado, San Diego.

eral engineer. Acting as purchasin agent is **Frank Worrell.**

Foremen are: Labor—**Pasquale A DeFalco, Bert E. Mares, Urcel W Myers, Paul M. Mowrey, Ellis F Houseman, Dell P. Tarter, C. I Tarter** and **Arnold A. Myers.** Carpen ter—**Earl R. Shambeau, Charles H Lewis, Otto H. Marquart, Guy Ethe ton, Theodore C. Sanford, Edwar Webber,** and **William S. Gies.** Iron worker—**Jack W. Atkinson, Alle Gray, Jr., Joe B. Gray** and **William H Hall.** Screen and mixing plant—**Ro T. Pyle, C. E. Cain, Albert Heronem** (welding), **Robin D. Ford** and **Roo ney M. Ford.** Truck—**Leo Steven** (mech.), **Paul J. Brock** and **C. A Scott. R. D. Smith** is finisher fore man; **Floyd L. Gray,** mechanical fore man; **Arthur Graham,** electrical **James R. Godfrey,** fitter general fore man; and **John A. Jackson,** fitte foreman.

NICHOLAS J. Morrisey has been appointed Director of the Department of Professional and Vocational Standards for the State of California, replacing James A. Arnerich, resigned. Morrisey has been an employee of the Contractors' State License Board since 1932 and has been Registrar of Contractors since 1950. Edward W. Ford will occupy the position of Registrar left vacant by Morrisey under a temporary appointment.

REGISTRAR N. J. Morrisey announces that an annual renewal fee of $7.00 for California state contractors' licenses for the fiscal year 1954-1955, starting next July 1, has been established by the Contractors' State License Board pursuant to Section 7137 of the Contractors' License Law.

A. D. (Cub) Dinsmore is superin tendent for R. P. Burn, the contracto who recently was awarded a $124,49 contract for a 1.4-mi. roadway an concrete bridge job and a $212,93 contract for the erection of a sewag treatment plant at Las Cruces, Ne Mex.

* * *

John Rumsey, Jr., is supervisin work on the first unit of the Auror Ave. grade separation in Seattl Wash., contract for which is held b Morrison-Knudsen Co., Inc., at a fig ure of $182,540.

* * *

D. K. Bruner, job superintenden and **E. J. Garbarini,** project manage head a long list of key personnel on carbon-steam power plant for th Utah Power & Light Co. at Castl Gate, Utah, being erected by th

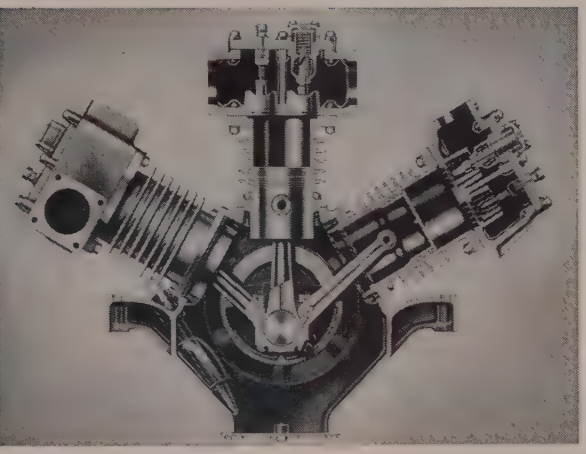
If you believe

ALL COMPRESSORS ARE ALIKE...

SIZE	COMP. H. P.	ENGINE H. P.	H. P. RESERVE	% RESERVE
600	134	202	68	33.7
315	75	117	42	35.6
210	51	78.5	27.5	35
160	37	57	20	35
105	25	42.5	17.5	41.6

check these three points

1. RESERVE POWER. There's plenty of that built into every Blue Brute. That means it takes thousands of hours of normal operation before engine wear affects the compressor's output.



2. EASY MAINTENANCE. All parts of the Blue Brutes are readily accessible. No special tools or complicated disassembly procedures are needed. And the compressor uses the same oil as the engine.

COMPRESSOR SIZE	ENGINE TYPE	GALLONS OF FUEL PER HOUR AT 80 PSI	GALLONS OF FUEL PER HOUR AT 100 PSI
60'	GASOLINE	1.31	1.42
105'	GASOLINE	2.16	2.35
	DIESEL	1.66	1.73
160'	GASOLINE	3.18	3.44
	DIESEL	2.45	2.60
210'	GASOLINE	4.32	4.70
	DIESEL	2.89	3.06
315'	GASOLINE	6.25	6.75
	DIESEL	4.38	4.64
600'	DIESEL	6.30	9.20

3. FUEL ECONOMY. How does your compressor stack up in comparison with the Blue Brute for economical fuel consumption? The figures shown have been determined under normal field operating conditions.

Get all the facts about the Blue Brute from your nearest Worthington distributor. Or write to Worthington Corporation, Construction Equipment Division, Section H.3.6, Plainfield, New Jersey.

WORTHINGTON

H.3.6

IF IT'S A CONSTRUCTION JOB, IT'S A *Blue Brute* JOB

ROCK DRILLS • WAGON DRILLS • PAVERS • CONCRETE MIXERS • PORTABLE PUMPS

Bechtel Corporation at a cost of about $10,000,000. **Vance Wise** is in the assistant superintendent spot. General foremen comprise: **Fred Martin,** ironworker; **Glen Palmer,** electrician; **L. E. Robertson,** carpenter; **Tom Pettingill,** powder; **Frank Misener,** labor; **John Woodson,** equipment; **Raymond Sadler,** reinforcing; **C. A. Kilgore, J. O. Walker, R. W. Clark, J. A. Brown** and **H. O. Cottrell,** carpenter; **W. O. Jensen,** powder; **Rex Schurtz,** structural; **Karl Huntsman,** welder; **N. A. Johnson, Jim Wilcox** and **I. W. Ailey,** labor. Job engineer is **C. F. Copeland** and **R. B. Bogan** is office manager. Design of plant is under the supervision of **R. A. Bowman,** chief power engineer. **W. H. Ness** is project engineer. For Utah Power & Light, **Don Watkins** is resident engineer and **Wilbur Smith,** accountant.

For the structural steel and plate erection which is being done under a subcontract held by Consolidated Western Steel Division, **H. (Ole) Olson** is the general superintendent, with the following foremen assisting: **Jacob Daley,** erection; **Dean Peterson,** welding, and **Russ Price,** fitting. This part of the work is drawing to a close.

* * *

Clayton Hoon, with the assistance of **Cal Rickel,** is supervising the $500,000 contract held by J. H.-N. M. Monaghan and Smith for highway construction on U. S. 85-87 south of Cheyenne, Wyo. Also working on this job, just about completing, are foremen: **Fred Harden,** carpenter; **"Bonney" Suniga, Joe Sedillo** and **Pete Garton,** labor; **Glen Kittredge,** excavation; **Frank Kemp,** asphalt plant, and **Harold Wold,** steel. Office is under management of **Bill Hunt.** Project engineer for the State is **A. L. (Put) Putnam.**

* * *

A. J. (Al) Hyde, job superintendent, heads a $392,975 contract for Alton V. Phillips who recently received a contract for erection of a structural steel and concrete bridge and approaches on S. S. Hwy. 1-A, at Nooksack River crossing in Washington. **George W. Slater** and **George Slater** (no relation) met for the first time at the job site when George W. took over as pile foreman and George took over as carpenter foreman.

* * *

Bob McPhee is job superintendent for J. B. Kenney, who was awarded the $190,000 contract for erection of sewage disposal plant for the city of Arvada, Colo. **John P. Schmidt** is McPhee's assistant.

* * *

Gail Loop is general superintendent and **Ed Kay** is project manager for a $444,000 job awarded this summer to Peter Kiewit Sons' Co. Work is in Sheridan, Wyo., and consists of widening and paving, and storm and sanitary sewers. Other men working on the job are **Ed Temple,** grade foreman; **Herb. Martelon,** sewer foreman; **"Monty" Montgomery,** concrete foreman, as well as **Bus Bracken,** master mechanic. **Don Odegard** is office manager.

* * *

A. M. Willis is superintending 4 mi. of grading and surfacing in Yellowstone National Park for Peter Kiewit Sons' Co., who received the contract on a bid of $266,636. **Walter Knopp** is another key man on the work.

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A. H. Cranmer is superintending Whiting & Haymond's $336,325 job of surfacing 2.2 mi. on U. S. 91 in Washington County, Utah, from St. George to Washington.

* * *

E. L. White, superintendent, **J. A. LaComb,** general foreman, and **P. A. Abbott,** office manager, are among the supervisory personnel on a 5.8-mi. grading-surfacing job in Orange County, Calif., recently awarded to Sully-Miller Contracting Co. on a bid of $254,127.

* * *

Bob Greene, job superintendent, and **Jim Gibson,** general construction superintendent, head the supervisory personnel for A. J. Raisch Paving Co. on a $324,995 contract for bituminous overlay over pavement at Moffett Field, Calif. Another key man on the job is **Clarence Farnquist,** asphalt plant and crusher plant assistant superintendent.

* * *

Jack Samuelson is project manager for General Construction Co. for pier development work at Everett, Wash., a $370,000 job consisting of razing existing pier aprons and open deck, construction of new bulkheads, new aprons, etc. **Roy W. Johnson,** Seattle, is acting as consulting engineer. **Frank H. Chick,** Everett, is resident engineer.

. . . Continued on page 106

LINED UP HERE are N. A. Nelson Construction Co. personnel at work on a new 100-bed memorial hospital for Sheridan County, Wyo. From left, above, are *George Nay*, concrete foreman; *N. A. Nelson, Jr.*, general superintendent; *N. A. Nelson*, contractor; *F. H. Randall*, carpenter foreman; *Carl Prestfeldt*, steel foreman; *Gus Sticka*, brick foreman, and *H. C. Fountaine*, inspector for Fisher & Fisher, architect. Below, from left, are subcontractors' men: *Walter Harker, Clarence Slye, W. S. Holtzman*, and *P. T. Roush*.

How a CAT* No. 12 grades to **fine tolerances**

THE 16-acre Skyway Drive-in Theater, Nashville, Tennessee, must be resurfaced each spring before the season opens. McDowell & McDowell, of Nashville, do this job with a Caterpillar No. 12 Motor Grader. It pulls all the ditches and spreads crushed rock to a depth of 6 inches on the roads and 4 inches on the ramps. The project calls for moving 29,000 tons of stone, and the grader handles 1000 tons a day, making 4 passes over each line of ramp and road.

For good drainage and smooth parking a job of this kind demands grading to very close tolerances. And the Cat No. 12 "hits it on the nose." How is it possible for the big yellow machine to work within ½ inch of grade?

Perfect balance of power, frame and blade is one reason. Others are positive, easy-acting controls, constant mesh transmission and full range of blade positions. But most important of all is job visibility. The operator *doesn't have to stand* to see his work. From the driving seat he can watch the front wheels and both ends of the blade, keeping them in exact adjustment.

Fuel economy, simplicity, durability and long life are other advantages of the No. 12 Motor Grader. No wonder Roscoe McDowell says: "If a fellow expects to stay in business he had better get Caterpillar equipment. It really does the job."

Your Caterpillar Dealer has the right machine for your needs. He'll demonstrate it for you right on your own job, and he'll back its profitable work life with reliable service and genuine parts. Call him today!

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CONTRACTS

Summary of bids and awards for major Western projects

Alaska

$312,114—**Boen-Koon & Egge Cummins,** 3647 Stoneway, Seattle—Low bid for conc. hidden ammunition storage magazine and 4,000-ft. access rd., Big Delta; by C. of E.

$1,236,440—**J. H. Pomeroy & Co.,** 333 Montgomery St., San Francisco—Award for 66,000-sq. ft. conc. bldg. with built-up roof supported on steel purlins, Whittier; by C. of E.

Arizona

$203,418—**Fisher Contracting Co.,** Box 6306, Phoenix—Low bid for 1⅓ mi. of grading and draining, U. S. 60-70, Superior East; by St. Hwy. Dept.

$264,827—**Lloyd Goodman Construction Co.,** 145 N. Fraser, Mesa—Low bid for 4.9 mi. of grading and culverts, Verde Valley-Roosevelt Dam rd., Tonto Natl. Forest, Gila County; by BPR.

$209,968—**Isbell Construction Co.,** Box 958, Phoenix—Low bid for 8.2 mi. of grading, draining and subgrade seal coating, beginning 8½ mi. east of McNary on McNary-Eagar hwy.; by St. Hwy. Dept.

$114,260—**Martin Construction Co.,** Box 934, Tucson—Low bid for 3.6 mi. of grading and surf., St. 84, Casa Grande vicinity; by St. Hwy. Dept.

$223,102—**Orr & Orr Construction Co.,** 1702 W. Fillmore, Phoenix—Low bid for 19¼ mi. of widening and resurf., U. S. 80, Chiricahua to New Mex. state line; by St. Hwy. Dept.

$313,999—**Tiffany Construction Co.,** Box 6346, Phoenix—Low bid for grading and draining, widening, and bitum. plant mix, prime coat and seal coat, Phoenix; by St. Hwy. Dept.

California

$308,357—**Eugene G. Alves Construction Co.,** Box 950, Pittsburg—Award for 2.6 mi. of grading and surf., Alhambra Ave. extension and Pleasant Hill Rd., betw. Sign Rt. 4 and 2.6 mi. south, Contra Costa County; by Div. of Hwys.

$386,499—**L. C. Anderson Co.** and **E. Paul Ford Co.,** 3040 Hancock St., San Diego—Award for 1.9 mi. of grading and bitum. surf. and a reinf. conc. bridge, Barrett Junction east, San Diego County; by Div. of Hwys.

$3,167,710—**Arundel Corp.** and **L. E. Dixon Co.,** 409 S. California St., San Gabriel—Award for La Cienega and San Fernando Valley relief sewer, Unit B, Section 2, Los Angeles; by City.

$363,825—**Guy F. Atkinson Co.,** 223rd St. and Santa Fe Ave., Long Beach—Award for Freeway storm drain, Pomona; by Los Angeles Flood Control District.

$324,485—**Basich Bros. Construction Co., R. L. Basich & N. L. Basich,** 1148 N. San Gabriel Blvd., Garvey—Low bid for 2.4 mi. of grading and plant-mix surf., El Centro East, Imperial County; by Div. of Hwys.

$139,740—**Bosko & Bradarich Co.,** 8512 Fishman Rd., Pico—Low bid for outfall trunk sewer, Puente, Section 2A, Los Angeles; by Los Angeles County Sanitation District 21.

$1,199,103—**Dan Caputo,** 2711 Moorpark Ave., San Jose—Low bid for a portion of a steel bridge and 2.1 mi. of approaches, Sign Rt. 24 betw. Antioch Bridge and Emmaton's Landing, Sacramento County; by Div. of Hwys.

$327,650—**Marvin E. Collins,** 635 San Diego St., El Cerrito—Low bid for primary sewage treatment plant, San Pablo; by San Pablo Sanitary District.

$322,910—**T. E. Connolly, Inc.,** 461 Market St., San Francisco—Award for Camino tunnel with a 7-ft. diameter horseshoe-shaped section, Sly Park Unit, Central Valley Project; b USBR.

$419,764—**D & H Construction Co.,** 2131 Fulton Ave., Sacramento—Low bid for earthwork and structures, Unit 3, Mader Distr. System; by USBR.

$480,335—**John Delphia,** Box 607, Patterson—Low bid for 5. mi. of grading and surf. and a reinf. conc. bridge across Han Grieve Canyon, Sign Rt. 198 betw. Lone Pine Station and 2. mi. west of Hot Springs Canyon, Fresno County; by Div. o Hwys.

$619,170—**Fred J. Early, Jr., Co., Inc.,** 22124 S. Vermont Ave Torrance—Award for high speed apron fueling system, Grou I and II, Naval Air Station, Miramar; by U .S. Navy.

$1,075,507—**Engineering Constructors, Inc.,** Box 150, Sout Gate—Award for Camino Conduit with plate-steel pipe, Sl Park Unit, Central Valley Project; by USBR.

$276,428—**Frederickson & Watson Construction Co.,** 873 81s Ave., Oakland—Award for 5.9 mi. of grading and surf., FA County Rt. 1073 betw. 0.2 mi. south of Palo Cedro and Bell Vista, Shasta County; by Div. of Hwys.

$570,614—**Harms Bros.,** 5261 Stockton Blvd., Sacramento—Low bid for 2.5 mi. of grading and surf., Sign Rt. 140 betw King Solomon Mine and Briceburg, Mariposa County; b Div. of Hwys.

$491,161—**Harms Bros.,** 5261 Stockton Blvd., Sacramento—Award for 4.7 mi. of grading and surf., U. S. 395, Secret Valle North, Lassen County; by Div. of Hwys.

$179,263—**Arthur A. Johnson,** 421 Pearl St., Laguna Beach—Award for 1.9 mi. of grading and bitum. surf., betw. 0.3 m west of Palomar Mt. rd. and Rancho Cuca, San Diego County by Div. of Hwys.

$593,200—**W. E. Kier Construction Co.,** 2323 E. Rosecran Ave., El Segundo—Award for Randsburg Wash test rang and rocket facilities, China Lake, Naval Ordnance Test Sta tion, Inyokern; by U. S. Navy.

$2,082,965—**Peter Kiewit Sons' Co.,** 345 Kieways Ave., A cadia, and **Fred J. Early, Jr., Co., Inc.**—Award for Section Unit A, La Cienega and San Fernando Valley relief sewe Alternate B, Los Angeles; by City.

$4,387,774—**Peter Kiewit Sons' Co.,** 442 Post St., San Fra cisco—Award for 3 mi. of grading and paving for 2 additiona lanes and a traffic interchange and overcrossing at Ashby Ave Eastshore Freeway betw. Ashby Ave. and El Cerrito Over head, Alameda County; by Div. of Hwys.

$1,625,575—**C. H. Leavell & Co.,** 1900 Wyoming St., El Pas Tex.—Award for training facilities at Marine barracks, Cam Pendleton; by U. S. Navy.

$165,275—**Lowrie Paving Co., Inc.,** 1755 Evans Ave., Sa Francisco—Low bid for track removal and reconstruction o pavement on Clement St., San Francisco; by City.

$142,521—**W. F. Maxwell,** 634 S. Western Ave., Los Angele —Award for bridge and approaches across Kaweah Rive about 4.6 mi. east of Woodlake on St. 131, Tulare County; b Div. of Hwys.

$1,964,000—**H. B. Nicholson,** 880 E. Colorado St., Pasadena—Award for North Reseda Jr. High School, Los Angeles; b City.

$195,104—**Rice Bros., Inc.,** 8th and Yuba Sts., Marysville—Award for 5.3 mi. of grading and surf., FAS County Rt. 81 Clovis Ave. betw. U. S. 99 and Columbia Ave. south, Fresn County; by Div. of Hwys.

$300,754—**M. J. Ruddy & Son,** 922 J St., Modesto—Award fo 3.9 mi. of widening and resurf. Sign Rt. 140 betw. 10 mi. we of Merced and Merced, widening 2 reinf. conc. bridges an construction of 1 reinf. conc. bridge, Merced County; by Di of Hwys.

$413,355—**S & Q Construction Co.** and **Rayor Constructio Co.,** 48 So. Linden Ave., South San Francisco—Award fo water treatment plant at Travis AFB; by City of Vallejo.

$357,047—**T. E. Sherlock,** 1103 W. 40th Pl., Los Angeles—Award for 10 mi. of improvements on Loveland St., vicinit of Bell Gardens; by Los Angeles County.

$163,695—**Edward R. Siple Co.,** 2545 San Fernando Rd., Lo Angeles—Low bid for missile landing aircraft service pa Point Mugu; by U. S. Navy.

$328,555—**Wm. A. Smith Contracting Co. of California** an **Fredericksen & Kasler,** 108 W. 6th St., Los Angeles—Lo bid for railroad spurs at Edwards AFB; by C. of E.

46,530—**Stolte, Inc.,** 8451 San Leandro St., Oakland—Low l for pipe conduit in 32nd and Wood Sts. betw. Ettie and th, Oakland; by City.

,193,467—**A. Teichert & Son, Inc.,** Box 1113, Sacramento—ow bid for 12.3 mi. of grading and plant-mix surf. and wid-ing a bridge across Arroyo Sequit, betw. Little Sycamore reek and Escondido, Los Angeles County; by Div. of Hwys.

50,765—**J. A. Thompson & Son, Inc.,** Box 518, Inglewood—ow bid for grading Bakersfield College site, Bakersfield; by ern County Union High School and Junior College District.

454,166—**Ukropina-Polich-Kral and John R. Ukropina,** Box 05, San Gabriel—Low bid for 2.7 mi. of grading and plant-ix surf., Lakewood Blvd. and Carson St., Los Angeles ounty; by Div. of Hwys.

715,859—**Ukropina-Polich-Kral and John R. Ukropina,** Box 05, San Gabriel—Low bid for 9.1 mi. of grading and surf., . S. 99 betw. Oroville Wye and junction with Rt. 87 north f Oroville, Butte County; by Div. of Hwys.

196,922—**Valley Paving Co.,** Box 6, Pismo Beach—Low bid or 2.4 mi. of grading and surf. and a reinf. conc. slab bridge, J. S. 466 betw. Palo Priesto rd. and Sign Rt. 41, San Luis Obispo County; by Div. of Hwys.

478,074—**Webb & White,** 7220½ Melrose Ave., Los Angeles —Award for 11 mi. of grading and asph. conc. paving and a einf. conc. bridge, Slauson Ave. betw. Telegraph Rd. and Rosemead Blvd., Los Angeles County; by Div. of Hwys.

Colorado

$729,400—**Schmidt Construction Co.,** Grand Junction—Low bid for 10.4 mi. of plant-mix surf., St. 4, Garfield County; by St. Hwy. Dept.

Idaho

$113,765—**Aslett Construction Co.,** Box 799, Twin Falls—Low bid for 11.2 mi. of gravel and bitum. surf., Sawtooth Park hwy., Salmon Natl. Forest; by BPR.

$476,781—**L. T. Johnson Construction Co.,** 709 Wall Ave., Ogden, Utah—Award for 5.7 mi. of grading and bitum. surf., North Side hwy. betw. Wendell and Jerome, Gooding and Jerome counties; by St. Dept. of Hwys.

$369,750—**Triangle Construction Co.,** 3507 Crescent Rim Dr., Boise—Low bid for 8.8 mi., Rock Creek-Cold Springs rd., Clearwater Natl. Forest; by BPR.

Montana

$736,589—**Albert LaLonde Co.,** Sidney—Award for 4 mi. of grading, gravel surf., road-mix oil and draining, Great Falls-Armington hwy., Cascade County; by St. Hwy. Comm.

$124,364—**N. A. Nelson Construction Co.,** Box 644, Sheridan, Wyo.—Award for a 219.7-ft. steel and conc. bridge over Swan River, Polson-Big Fork-Haines Corner hwy., Flathead County; by St. Hwy. Comm.

$293,001—**Northwestern Engineering Co.,** 1311 St. Joe St., Rapid City, So. Dak.—Award for 7 mi. of grading, gravel surf., plant-mix, oil and draining, Wyoming st. line-Crow Agency hwy., Big Horn County; by St. Hwy. Comm.

$135,315—**W. P. Roscoe Co.,** Billings—Award for a 63-ft. treated timber pile bridge and a 240-ft. steel and conc. bridge, Dodson South hwy., Phillips County; by St. Hwy. Comm.

$384,285—**Union Construction Co., Inc.,** Missoula—Award for 8.4 mi. of grading, gravel surf. and draining, Bonner-Ovando hwy., Missoula and Powell counties; by St. Hwy. Comm.

New Mexico

$205,198—**Jack Adams,** Box 610, Los Alamos—Award for 4.7 mi. of grading, draining, and asph. surf., White Rock-Bandelier rd., Los Alamos County; by St. Hwy. Dept.

$295,531—**Brown Contracting Co.,** Box 1479, Albuquerque—Award for 8.9 mi. of grading, draining and asph. paving, U. S. 66, Albuquerque west, Bernalillo County; by St. Hwy. Dept.

$716,865—**Lowdermilk Bros.,** Box 568, Espanola—Award for 49.8 mi. of asph. paving, U. S. 54 betw. Corona and Carrizozo, Lincoln County; by St. Hwy. Dept.

$238,286—**G. I. Martin,** 520 Tulane Dr., S.E., Albuquerque—

Award for 8.3 mi. of roadbed preparation, St. 368 betw. Tinnie and Arabella, Lincoln County; by St. Hwy. Dept.

$488,308—**J. H. Ryan & Son,** Box 513, Albuquerque—Award for structural steel and conc. Barelas bridge and approaches U. S. 85, Bernalillo County; by St. Hwy. Dept.

$210,555—**Skousen Construction Co.,** 201 Springer Bldg. Albuquerque—Award for 9.4 mi. of roadbed preparation, St 78 betw. junction with U. S. 260 and Mule Creek, Gran County; by St. Hwy. Dept.

$131,792—**Henry Thygesen & Co.,** Box 876, Albuquerque—Award for 10.4 mi. of base course stabilization and misc. work Barton-Miera rd., Bernalillo County; by St. Hwy. Dept.

$159,444—**Henry Thygesen & Co.,** Box 876, Albuquerque—Award for reinf. conc. Rio Puerco bridge, U. S. 66, Bernalillo County; by St. Hwy. Dept.

$124,924—**Henry Thygesen & Co.,** Box 876, Albuquerque—Award for 4.8 mi. of grading, draining and asph. surf., Highland and Pueblo rds., Albuquerque, Bernalillo County; by St Hwy. Dept.

Oregon

$103,625—**A. H. Beaty Construction Co.,** South Bend—Award for White Salmon River rd.; by BPR.

$328,694—**Durbin Bros.,** Eugene—Award for 8.7 mi. of grading, Pacific Hwy. south from Goshen, Lane County; by St Hwy. Comm.

$702,031—**Gibbons & Reed Co.,** 825 W. 9th North St., Salt Lake City—Award for 2.9 mi. of grading and 5 pile-trestle detour bridges, 42nd Ave.-92nd Ave. sect. of T. H. Banfield Expressway, Portland, Multnomah County; by St. Hwy Comm.

$925,903—**R. A. Heintz Construction Co.,** 211 N.E. Columbia Blvd., Portland—Award for 4.9 mi. of grading and paving Pacific Hwy. nr. Central Point and Medford, Jackson County by St. Hwy. Comm.

$636,970—**Peter Kiewit Sons' Co.,** Box 491, Longview, Wash —Award for 1,637-ft. reinf. conc. and steel deck truss bridge

ver North Umpqua River and S. P. tracks nr. Winchester, ouglas County; by St. Hwy. Comm.

34,018—**Tom Lillebo,** Reedsport—Award for a 392-ft. bridge n Smith River rd.; by BPR.

122,960—**P. S. Lord, Mechanical Contractors,** 4507 S.E. Milaukie Ave., Portland—Award for connecting mains at The Dalles water reservoir; by City.

462,920—**McNutt Bros.,** 351½ E. Broadway, Eugene—Award or 5.8 mi. of grading, Smith River rd. east of Gardner; by BPR.

129,560—**Pacific Dredging Co.,** 14409 S. Paramount Blvd., Paramount, Calif.—Award for Coos Bay and Isthmus Slough channel dredging; by C. of E.

$176,366—**United Builders, Inc.,** Beaverton—Award for 3 reinf. conc. deck girder structures with prestressed conc. girder spans at Haines rd., Bonita rd. and Upper Boones Ferry rd. intersections, West Portland-Hubbard Hwy., Clackamas and Washington counties; by St. Hwy. Comm.

$328,075—**J. G. Watts Construction Co.,** 4538 S.W. Macadam Ave., Portland—Award for 6.4 mi. of grading, Steamboat Creek and Singe Creek rds., Umpqua Natl. Forest, Douglas County; by BPR.

$189,294—**Young & Smith Construction Co.,** Grants Pass—Award for reconstruction of Halsey St. undercrossing over U. P. tracks east of 92nd Ave., Portland; by St. Hwy. Comm.

Washington

$272,546—**A. J. Cheff,** 10054 W. Marginal Way, Seattle—Low bid for 2.2 mi. of Kennewick Main Canal, Yakima Project; by USBR.

$889,045—**D & H Construction Co.,** 2131 Fulton Ave., Sacramento, Calif.—Low total bid for earthwork, pipe lines and structures, Eltopia Branch Canal, and North Part, Unit P-9, Potholes East Canal laterals, Columbia Basin Project; by USBR.

$3,651,475—**English Electric Export & Trading Co.,** 23-25 Beaver St., New York—Low bid for two 73,684-kva. generators at McNary Dam; by C. of E.

$269,587—**F. R. Hewett & Co.,** Box 46, Parkwater—Award for 10.1 mi. of grading, light bitum. surf., and a reinf. conc. bridge, P. S. H. No. 7, Burke Junction to Winchester, Grant County; by St. Hwy. Comm.

$164,825—**Long Construction Co.,** Box 1291, Billings, Mont.—Low bid for earth and conc. lining, East Low Canal and Lind Coulee wasteway; by C. of E.

$151,000—**G. V. Nolte & Co.,** Moses Lake—Low bid for curbs, gutters and sidewalks, Soap Lake; by City.

$183,172—**J. D. Shotwell Co.,** 3113 So. Pine St., Tacoma—Award for 6.4 mi. of grading, crushed stone surf., and stockpiling, P. S. H. No. 5, Rimrock to Trout Lodge, Yakima County; by St. Hwy. Comm.

$264,685—**Thorburn & Logozo,** 4608 36th, S.W., Seattle—Award for pipeline on S. 160th St., Seattle; by City.

$157,685—**L. W. Vail Co.,** Pasco—Award for surfacing, parking areas, sidewalks, sprinkling systems, etc., Camp Hanford; by C. of E.

Wyoming

$123,758—**Asbell Bros. Construction Co.,** Riverton—Award for 2.3 mi. of grading and draining, etc., Cody-Clarks Fork rd., Park County; by St. Hwy. Dept.

$187,968—**Stanley H. Arkright, Inc.,** 1200 6th Ave., Billings, Mont.—Award for 10.2 mi. of grading, draining, crushed gravel base, base course stabilization, etc., Gooseberry Creek rd., Washakie County; by St. Hwy. Dept.

$123,799—**C. L. Hubner Co.,** 4200 E. Jewell Ave., Denver, Colo.—Award for 2.2 mi. of grading, surf. and rd.-mix, oil treatment, etc., Bosler-Laramie rd.; by St. Hwy. Dept.

$259,462—**Lichty Construction Co.,** Box 1068, Riverton—Low bid for Schedules 1 and 2, earthwork, asph. membrane lining and structures, Ft. Laramie Canal; by USBR.

$178,970—**N. A. Nelson Construction Co.,** Box 644, Sheridan—Award for 1 rigid frame and 2 continuous slab span bridges and 10 reinf. conc. culverts on 10.2 mi. of Sundance-Beulah rd., Crook County; by St. Hwy. Dept.

$659,499—**Summit Construction Co.,** Box 1609, Rapid City, So. Dak.—Award for 10.2 mi. of grading and surf., etc., Sundance-Beulah rd., ½ mi. of same on Moskee connection and ditto on Sundance St., Crook County; by St. Hwy. Dept.

UNIT BID PRICES

Selected abstracts for Western projects

Bridge and Grade Separation

Alaska's first precast prestressed concrete bridge

Alaska—Copper River Highway—BPR. M. P. Munter Co., Seattle, Wash., was awarded a contr by the Bureau of Public Roads on the basis of a low bid of $145,957 for construction of the 0.05-mi.-l Eyak River bridge and 0.2 mi. of grading on Alaska Forest Highway Project 32-A2. The award based on Munter's bid for Proposal B, which called for timber pile bents with precast prestressed c crete superstructure units. Proposal A, for which Munter was also low bidder, comprised a conventio design trestle with timber pile bents, timber stringers (except for a steel channel span) and a cast-in-pl concrete deck. Unit prices were as follows:

	Proposal A	Proposal B
(1) M. P. Munter Co.	$148,574	$145,957
(2) Lytle-Green-Birch	158,800	none
(3) J. J. Badraun Co.	176,824	none

PROPOSAL A	(1)	(2)	(
4,400 cu. yd. unclassified excavation	4.00	4.80	5
15,000 cu. yd. unclass. excav. for borrow, Case 1	2.00	1.64	2
16,000 cu. yd. mi. special overhaul of borrow (1000-ft. freehaul)	.35	.24	
164 cu. yd. concrete, Class A	200.00	190.00	190
28,100 lb. reinforcing steel	.24	.21	
30,500 lb. structural steel (carbon) furn., fabricated and erected	.36	.34	
526 lin. ft. metal hand rail	8.00	9.00	7
40.3 Mfbm. treated timber, creosote preservative	500.00	568.00	650
17 ea. pile shoes	30.00	15.00	20
3,650 lin. ft. furnishing treated timber piling	2.65	2.00	3
74 ea. driving treated timber piling	90.00	239.00	150
Lump sum, removal and disposal of existing bridge	$3,650	$8,944	$3,

PROPOSAL B		
4,400 cu. yd. unclassified excavation	4.00	
15,000 cu. yd. unclass. excav. for borrow, Case 1	2.00	
16,000 cu. yd. mi. special overhaul of borrow (1000-ft. freehaul)	.35	
6 ea. 45-ft. precast interior slab units	$1,700	
2 ea. 45-ft. precast exterior slab units	$2,000	
28 ea. 30-ft. precast interior slab units	$1,300	
14 ea. 30-ft. precast exterior slab units	$1,325	
515 lin. ft. metal hand rail	8.00	
6.0 Mfbm. treated timber, creosote preservative	500.00	
17 ea. pile shoes	30.00	
2,750 lin. ft. furnishing treated timber piling	2.65	
56 ea. driving treated timber piling	90.00	
Lump sum, removal and disposal of existing bridge	$3,650	

Irrigation

First unit of the Boulder Creek Supply Canal; alternate for timbe and prestressed concrete bridge decks

Colorado—Colorado-Big Thompson Project—USBR. Bales & Kite, Kansas City, Mo., was awar a $972,077 contract by Bureau of Reclamation for Schedule 2, construction of the first 13 mi. of Boulder Creek Supply Canal between Lyons and Boulder. Bales & Kite was also low with a bid $976,285 for Schedule 1. Difference in the two schedules is in specifications for construction of the bri decks, Schedule 2 calling for timber bridge decks, and Schedule 1 specifying prestressed-prec concrete bridge decks. Schedule 2 will be presented in its entirety but only the current bridge spe cations will be reprinted from Schedule 1. Unit bids were submitted as follows:

Schedule 1	
(1) Bales & Kite	$ 976,285
(2) Lowdermilk Bros.	1,012,800
(3) G. L. Tarlton Contracting Co.	1,054,953
(4) Peter Kiewit Sons' Co.	1,097,625
— K. S. Mittry Construction Co.	1,228,214
(5) Engineer's estimate	844,742

Schedule 2	
(1) Bales & Kite	$ 972,
(2) Lowdermilk Bros.	1,003,
(3) Colorado Constructors, Inc.	1,031,
(4) G. L. Tarlton Contracting Co.	1,053,
— Peter Kiewit Sons' Co.	1,091,
— K. S. Mittry Construction Co. and O. K. Mittry	1,221,
(5) Engineer's estimate	837,

SCHEDULE 2	(1)	(2)	(3)	(4)	(
323,000 cu. yd. excav., common, for canal	.20	.425	.60	.60	
58,200 cu. yd. excav., rock, for canal	2.00	.425	.60	1.25	1
20,000 cu. yd. excav. from borrow	.25	.23	.30	.35	
24,500 cu. yd. excav., com., for drainage chans. and ditches	.50	.50	.50	.40	
100 cu. yd. excav., rock, for drainage chans. and ditches	3.00	1.50	4.00	5.00	2
10,000 mi. cu. yd. overhaul	.50	.35	.40	.20	
163,000 cu. yd. compacting embankments	.30	.20	.25	.30	
41,000 cu. yd. placing earth lining	.25	.40	.50	.72	
50,000 cu. yd. compacting earth lining	.30	.60	.25	.35	
37,200 cu. yd. excav., common, for structs.	1.50	2.00	1.80	.80	1
3,400 cu. yd. excav., rock, for structs.	3.50	2.00	3.25	3.50	2
30,600 cu. yd. backfill about structs.	.60	.30	.75	.40	
12,350 cu. yd. compacting backfill about structs.	2.75	4.75	4.00	5.00	3
3,000 cu. yd. placing fill at top of earth lining	.25	1.50	1.00	.50	
1,500 cu. yd. riprap	7.00	37.50	7.50	7.00	5
80 cu. yd. gravel bedding for riprap	10.00	6.00	6.00	7.00	5
237 lin. ft. furn. and laying 8-in. diam. conc. irrigation pipe for drains	1.50	2.00	2.00	1.40	2

Continued on page 107

*On the job—On time**

STANDARD PORTLAND
MODIFIED PORTLAND
HIGH EARLY STRENGTH
LOW HEAT
SULPHATE RESISTANT
PRONTO (Pipe Cement)
PORTLAND POZZOLAN
BRICK MIX
PLASTIC CEMENT
OIL WELL CEMENTS

* SERVICE MARK

THROUGHOUT THE WEST

it's Permanente Cement

PERMANENTE HIGH EARLY STRENGTH PORTLAND CEMENT was designed to meet the requirements of modern high speed construction. Its most efficient use is well illustrated in the inset photo above—the repair of the pilings and substructure of the San Mateo Bridge without disrupting heavy bridge traffic. Although official estimates allowed 175 days for completion of the work, pressure gun application with High Early Portland cement permitted the crew to finish in 64 days—111 DAYS AHEAD OF SCHEDULE!

PERMANENTE HIGH EARLY STRENGTH PORTLAND CEMENT sets and hardens rapidly, developing in 24 hours a strength equal to standard portland cement after 7 days. In 72 hours high early concrete has strength equal to that made with standard portland after 28 days. Such concrete does not retrogress in strength; it grows continually stronger with age, and is permanently sound and enduring.

PERMANENTE
CEMENT COMPANY

ERMANENTE, SANTA CLARA, YOSEMITE AND KAISER BRANDS OF PORTLAND CEMENT AND PERMANENTE LIME PRODUCTS

OAKLAND • PORTLAND • SEATTLE
ANCHORAGE • FAIRBANKS • HONOLULU

MORE SUPERVISORS

J. G. Legg is general superintendent for Rosendahl Corp. on the installation of heavy mechanical equipment for the Blue Diamond Corp. at its new hardboard plant and plaster mill at Blue Diamond, Nev. He has the assistance of **J. Hoffman**, millwright superintendent; **W. Williams**, rigging superintendent, and **P. Greenwood**, office manager.

On the Rosendahl contract for the construction of the Cumene plant for Standard Oil Co. of California at its refinery at El Segundo in southern California, **M. Watt** is project superintendent. Other key personnel are **C. Lafrenz**, project engineer; **E. A. Hillman** and **P. Gantz**, field engineers; **J. Smith**, piping superintendent, and **J. Free**, office manager.

On another Rosendahl job covering construction of additions to a boiler plant at Standard Oil's Richmond refinery, **A. R. Popperwell** is acting as project manager. Also on the job are the following superintendents: **H. Hansen**, mechanical; **A. Hockanson**, concrete, and **H. Hammer**, piping. **Carl Replogle** is job engineer and the office manager is **J. Turner**.

* * *

R. E. Trask, Jr., is supervising the Eaton & Smith $603,305 contract for grading work and bridges near Shaver Lake, Sierra National Forest, California. Others in key positions are: **Perry Webb**, grading foreman; **Emerson Ingalls**, master mechanic; **R. E. Barkwill**, office manager, and **R. Stinson**, camp manager.

* * *

Hubert M. Roth, job superintendent, assisted by grading foreman **Donald F. (Bud) England**, and foreman **H. E. Roth** and **Robert A. Millard**, is supervising a $126,779 contract held by England & Roth Construction Co. for 4.3 mi. of grading, draining, surfacing and 3 treated timber bridges on Upton-Haycreek road, for the Wyoming State Highway Department.

* * *

William E. Benson, superintendent, assisted by plumber superintendent **Jesse B. Hill** and plumber foreman **Gerald Blume**, is supervising a $565,757 contract recently awarded the Macri Construction Co. for the installation of outside utilities for rehabilitation of Sunflower area No. 1, Elmendorf AFB, Alaska.

* * *

W. J. Weidler, assisted by **Kenneth Worth**, has been heading up two building projects for the Carter Oil Co. in Montana. One was a $37,000 job at Miles City, consisting of a service station, truck terminal, etc., and the other was a $19,500 contract for similar work at Glendive. The Weidler Construction Co. was the contractor.

UNIT BID PRICES ... CONTINUED

		(1)	(2)	(3)	(4)	(5)
1,100	cu. yd. excav., all classes, for roads	1.50	.40	.25	1.25	1.00
670	cu. yd. selected surfacing for roads	4.00	2.75	2.50	3.00	2.50
ump sum,	resurfacing State Highway No. 7 crossing	500.00	150.00	$1,000	$1,000	500.00
2,250	cu. yd. concrete in structs.	85.00	90.00	80.00	75.00	65.00
3,300	bbl. furn. and handling cement	6.50	6.75	6.50	7.70	6.50
'0,500	lb. furn. and placing reinf. bars	.17	.14	.15	.16	.15
ump sum,	construct. farm turnout at Sta. 95+55	$1,050	$1,750	$1,450	$1,500	$1,100
ump sum,	construct. farm turnout at Sta. 210+80	$1,000	$1,750	$1,450	$1,500	$1,100
ump sum,	construct. farm turnout at Sta. 218+35	$1,450	$1,750	$1,450	$1,500	$1,100
ump sum,	construct. farm turnout at Sta. 349+00	$1,450	$1,750	$1,450	$1,500	$1,100
ump sum,	construct. farm turnout at Sta. 367+50	$1,200	$1,750	$1,450	$1,500	$1,100
ump sum,	construct. farm turnout at Sta. 520+80	$1,500	$2,000	$1,500	$1,700	$1,200
ump sum,	construct. farm turnout at Sta. 556+95	$1,250	$1,750	$1,450	$1,500	$1,100
180	lin. ft. placing 6-in., type H, rubber water stop in jts.	1.50	2.50	2.00	3.00	1.50
74.3	M.B.M. furn. and erecting untr. timber in structs.	350.00	350.00	330.00	345.00	300.00
9.0	M.B.M. furn. and erecting treated timber in structs.	350.00	380.00	370.00	390.00	350.00
1.2	mi. furn. matls. and constr. barbed-wire right-of-way fence	$1,500	$1,750	$1,800	$1,800	$1,800
45	struct. furn. and constructing canal fence structs.	125.00	275.00	135.00	150.00	150.00
2.3	mi. removing fences	400.00	316.80	300.00	300.00	300.00
2.0	mi. removing and rebuilding fences	880.00	950.40	800.00	$1,200	$1,200
3	post furn. and erecting timber guard posts	15.00	15.00	10.00	10.00	10.00
52	lin. ft. furn. and laying 15-in. diam. corru.-metal pipe	3.00	3.75	4.00	4.00	3.55
646	lin. ft. furn. and laying 18-in. corrugated-metal pipe	3.50	4.25	4.75	4.50	4.25
500	lin. ft. furn. and laying 21-in. corrugated-metal pipe	4.50	4.85	5.50	5.25	5.00
550	lin. ft. furn. and laying 24-in. corrugated-metal pipe	5.50	5.25	6.00	5.75	6.35
474	lin. ft. furn. and laying 30-in. corrugated-metal pipe	7.50	7.00	7.50	7.00	7.85
262	lin. ft. furn. and laying 36-in. corrugated-metal pipe	12.00	12.00	11.00	11.50	11.40
168	lin. ft. furn. and laying 42-in. corrugated-metal pipe	14.00	13.00	12.75	13.50	13.30
30	lin. ft. furn. and laying 43-in. by 27-in. corrugated metal pipe arch	12.00	9.00	9.00	10.00	11.65
4	transition furn. and installing 36-in. diam. corru-metal pipe transitions	150.00	165.00	150.00	160.00	125.00
120	lin. ft. furn. and laying 15-in. diam. HC50 conc. pipe with type B joints	3.50	4.25	5.00	5.00	4.70
292	lin. ft. furn. and laying 24-in. diam. HC50 conc. pipe with type B joints	7.50	7.85	8.00	8.50	7.80
218	lin. ft. furn. and laying 30-in. diam. HC50 conc. pipe with type B joints	10.50	10.50	11.00	11.50	10.30
315	lin. ft. furn. and laying 36-in. diam. HC50 conc. pipe with type B joints	14.50	12.65	15.00	15.00	13.60
141	lin. ft. furn. and laying 42-in. diam. HC50 conc. pipe with type B joints	19.50	17.50	20.00	21.00	16.90
292	lin. ft. furn. and laying 48-in. diam. HC50 conc. pipe with type B joints	24.50	20.25	24.00	26.00	20.50
108	lin. ft. furn. and laying 54-in. diam. HC50 conc. pipe with type B joints	30.00	25.75	29.00	31.00	24.50
143	lin. ft. furn. and laying 60-in. diam. HC50 conc. pipe with type B joints	37.00	32.50	35.00	36.50	28.50
72	lin. ft. furn. and laying 66-in. diam. HC50 conc. pipe with type B joints	43.50	38.50	42.00	44.00	33.00
72	lin. ft. furn. and laying 72-in. diam. HC50 conc. pipe with type B joints	51.00	45.00	50.00	49.50	37.50
79	lin. ft. furn. and laying 78-in. diam. HC50 conc. pipe with type B joints	60.00	52.50	56.00	56.00	42.00
68	lin. ft. furn. and laying 54-in. diam. HE50 conc. pipe with type B joints	31.00	28.00	30.00	33.50	27.00
2,598	lin. ft. furn. and laying 66-in. diam. HC50 conc. pipe with type B joints	55.00	42.50	58.00	54.50	36.50
64	lin. ft. furn. and laying 66-in. diam. extra-str. conc. culvert pipe with type B joints	58.00	54.00	60.00	60.00	40.00
2	unit furn. and laying 24-in. diam. precast-conc. transitions for conc. pipe	75.00	60.00	60.00	70.00	70.00
2	unit furn. and laying 30-in. diam. precast-conc. transitions for conc. pipe	115.00	97.50	90.00	100.00	110.00
5	unit furn. and laying 36-in. diam. precast-conc. transitions for conc. pipe	150.00	130.00	120.00	135.00	160.00
2	unit furn. and laying 42-in. diam. precast-conc. transitions for conc. pipe	200.00	170.00	160.00	200.00	200.00
3	unit furn. and laying 48-in. diam. precast-conc. transitions for concrete pipe	250.00	215.75	200.00	225.00	250.00
4	shelter furn. and erecting gaging station shelters	250.00	400.00	225.00	300.00	350.00
78,400	lb. furn. and installing metal pipe flume between coupled ends	.43	.38	.40	.40	.24

(Continued on next page)

UNIT BID PRICES... CONTINUED

	(1)	(2)	(3)	(4)	
5,500 lb. furn. and installing metal slide gates	.70	.80	.70	.75	
5,740 lb. furn. and installing miscl. metalwork	.60	1.00	1.00	.50	
2,000 lb. furn. and installing blow-off valves and connections for siphons	.75	2.20	.60	1.80	
18 lin. ft. furn. and laying 48-in. corrugated-metal pipe	17.50	20.00	18.00	18.00	18
SCHEDULE 1					
4 deck furn. and erecting prestressed precast-concrete decks for county road bridges	$3,100	$3,500	$2,800	$3,500	$3,
2 deck furn. and erecting prestressed pre-cast-concrete decks for skewed country road bridges	$5,150	$5,750	$4,700	$6,000	$4,
3 deck furn. and erecting prestressed precast-concrete decks for O&M bridges	$1,750	$2,500	$1,600	$2,000	$1,

Dam

Small earthfill dam in New Mexico

New Mexico—Rio Grande Project—USBR. Witt & Ross, Inc., Carlsbad, was low with $49, before the Bureau of Reclamation for construction of the earthfill Picacho South dam for the Cruces Division of the Rio Grande Project. Unit prices were as follows:

(1) Witt & Ross, Inc.	$49,685	(5) Hugh McMillan	$68,
(2) Thomas J. Martin	50,623	— J. F. Schroeder & Sons	74,
(3) Max Jensen Construction Co.	59,785	— Miller & Smith, Contractors	78,
(4) C. H. Berry	63,129	(6) Engineers' estimate	61,

	(1)	(2)	(3)	(4)	(5)	
9,000 cu. yd. excavation for dam foundation	.26	.40	.20	.24	.275	
12,000 cu. yd. excavation for outlet works	.365	.40	.24	.24	.825	
20 cu. yd. gravel blanket	5.00	5.00	5.00	8.00	11.00	4
950 cu. yd. riprap	5.50	5.88	3.00	7.50	5.50	7
64,000 cu. yd. earth fill in dam embank., Zone 1	.33	.325	.525	.47	.462	
25,500 cu. yd. sand, gravel, and cobble fill in dam embank., Zone 2	.33	.24	.42	.53	.4125	
200 cu. yd. special compaction of embankment	3.50	4.35	6.00	1.75	4.785	
120 lin. ft. furn. and laying precast-concrete pipe	26.87	32.40	22.00	36.85	37.84	1
50 bbl. furn. and handling cement	5.50	14.25	5.50	6.00	15.675	7
5,200 lb. furn. and placing reinf. bars	.18	.21	.40	.10	.231	
33 cu. yd. conc. in intake and outlet structs., and cut-off walls	90.00	92.57	50.00	49.00	102.30	8

Highways and Streets

An 18.8-mi. access road

Utah—Grand and San Juan counties—BPR. Arnold Schulthes, Vernal, submitted a low bid $77,940 before the Bureau of Public Roads for construction of the 18.8-mi. Shafer Trail access r with a 12-ft.-wide roadbed. Unit bid prices were as follows:

(1) Arnold Schulthes	$ 77,940	— J. M. Sumsion & Sons	$101,
(2) Victor Newman	83,880	— Martindale & Blackett	101
(3) Kent Johnson	86,148	— Whiting & Haymond	103
(4) Barben, Moore & Barben	88,221	— L. T. Johnson Construction Co.	110
(5) H. J. Wimmer	88,878	— Fred Berquist & Theo Wood	110
— Stanley Jensen	94,680	— H. W. Glenn & D. W. Brimhall	114
— Germer, Abbott & Waldron	97,721	— C. Hunt	115
— Denby & Stevens	99,190	— Ford Construction Co., Inc.	132

	(1)	(2)	(3)	(4)	
850 hr. tractor No. 1	9.00	10.00	9.90	9.45	
170 hr. overtime rate, tractor No. 1	9.00	10.00	9.90	9.45	
850 hr. tractor No. 2	9.00	10.00	9.90	9.45	
170 hr. overtime rate, tractor No. 2	9.00	10.00	9.90	9.45	
850 hr. tractor No. 3	9.00	10.00	9.90	9.45	
170 hr. overtime rate, tractor No. 3	9.00	10.00	9.90	9.45	
800 hr. air compressor No. 1 portable 105 cfm w/airline, airhose, etc. and jackhammer (Sullivan 55-lb. or equal) comp. with bits and assort. of drill steel	4.00	4.25	4.90	4.75	
160 hr. overtime rate, compressor No. 4	4.00	4.25	4.90	4.75	
800 hr. air compressor No. 2 portable 105 cfm w/airline, airhose, etc. and jackhammer (Sullivan 55-lb. or equal) compl. with bits and assort. of drill steel	4.00	4.25	4.90	4.75	
160 hr. overtime rate, compressor No. 2	4.00	4.25	4.90	4.75	
800 hr. air compressor No. 3, portable 105 cfm w/airline, airhose, etc. and jackhammer (Sullivan 55-lb. or equal) compl. with bits and assort. of drill steel	4.00	4.25	4.90	4.75	
160 hr. overtime rate, compressor No. 3	4.00	4.25	4.90	4.75	
550 hr. air compressor 210 cfm. portable w/airline, airhose, all accessories, etc. and 2 jackhammers (Sullivan 55-lb. or equal) with bits and asst. of drill steel	7.50	8.00	9.90	11.75	
110 hr. overtime rate for compressor	7.50	8.00	9.90	11.75	
600 hr. motor grader, tandem drive, min. 70 h.p.	7.50	8.00	8.00	7.75	
120 hr. overtime rate, motor grader	7.50	8.00	8.00	7.75	
500 hr. dump truck No. 1	4.00	4.00	4.00	4.50	
100 hr. overtime rate, dump truck No. 1	4.00	4.00	4.00	4.50	
500 hr. dump truck No. 2	4.00	4.00	4.00	4.50	
100 hr. overtime rate, dump truck No. 2	4.00	4.00	4.00	4.50	
500 hr. dump truck No. 3	4.00	4.00	4.00	4.50	
100 hr. overtime rate, dump truck No. 3	4.00	4.00	4.00	4.50	
500 hr. dump truck No. 4	4.00	4.00	4.00	4.50	
100 hr. overtime rate, dump truck No. 4	4.00	4.00	4.00	4.50	
500 hr. dump truck No. 5	4.00	4.00	4.00	4.50	
100 hr. overtime rate, dump truck No. 5	4.00	4.00	4.00	4.50	

	(1)	(2)	(3)	(4)	(5)
0 hr. dump truck No. 6	4.00	4.00	4.00	4.50	4.50
0 hr. overtime rate, dump truck No. 6	4.00	4.00	4.00	4.50	4.50
0 hr. power shovel, ½ cu. yd. minimum capacity	7.25	7.00	7.00	7.75	8.00
0 hr. overtime rate, power shovel	7.25	7.00	7.00	7.75	8.00
0 hr. tractor, crawler type, min. 80 h.p. with dozer and power control	9.00	10.00	9.90	9.45	9.80
0 hr. overtime rate for tractor	9.00	10.00	9.90	9.45	9.80
0 hr. scraper, LeTourneau or equal, 9 cu. yd.	.50	1.00	1.00	1.50	1.00
0 hr. overtime rate for scraper	.50	1.00	1.00	1.50	1.00
0 hr. ripper for use with 80 h.p. tractor (Isaacson Model KSR 80 or equal)	.50	1.00	.25	1.50	1.00
0 hr. overtime rate for ripper	.50	1.00	.25	1.50	1.00

Asphaltic concrete paving of county roads in Oregon

Oregon—Multnomah County—State. Parker-Schram Co., Portland, submitted a low bid of $159,718 efore the State Highway Department for grading and paving on several county roads. Unit bids were s follows:

(1) Parker-Schram Co. $159,718
(2) Morrison & Lamping 163,275
(3) D-H Paving Co. 163,475
(4) Porter W. Yett 164,966
(5) Warren Northwest, Inc. $175,140
(6) Babler & Rogers 181,280
— Pacific Asphaltic Paving Co. 205,753

	(1)	(2)	(3)	(4)	(5)	(6)
4.68 mi. roadbed widening	$1,250	750.00	750.00	200.00	500.00	$2,000
9,000 cu. yd. 2½-in. - 0 material in base	2.95	3.00	3.00	3.00	3.00	3.50
4,400 ¾-in. - 0 material in base and shoulders	3.55	3.30	3.25	3.50	4.00	3.60
600 M. gal. sprinkling	2.50	2.00	2.50	3.00	3.00	2.00
550 cu. yd. ¾-in. - 0 material in binder course	4.00	4.00	4.50	4.00	5.00	4.00
90 ton RC-3 asphalt in binder course	40.00	37.50	40.00	35.00	45.00	40.00
1,300 ton Class "B" asphaltic concrete	6.36	6.85	6.80	7.10	7.50	7.00
60 ton RS-1 emulsified asphalt in pavement seal	32.00	40.00	40.00	40.00	50.00	30.00
370 cu. yd. aggregate in pavement seal	3.00	4.50	5.00	5.00	5.00	4.00

Miscellaneous

Reinforced concrete pipe culvert and metal retaining wall

California—Los Angeles County—State. D. E. Higday, Temple City, submitted a low bid of 16,902 before the Division of Highways for installation of a reinforced concrete pipe culvert at Mile .8 and construction of a metal bin-type retaining wall at Mile 5.15 on Topango Canyon Road. Unit rices were as follows:

(1) D. E. Higday $16,902
(2) Norman I. Fadel 18,500
(3) Westway Excavating Co. $18,995
(4) N. M. Saliba Co. 20,320

	(1)	(2)	(3)	(4)
Lump sum, removing existing timber bulkhead	565.00	400.00	625.00	500.00
Lump sum, removing tree	135.00	100.00	300.00	250.00
600 cu. yd. structure excavation (culvert)	3.85	6.00	6.00	4.00
,200 cu. yd. struct. excav. (metal bin type retaining wall)	3.35	3.00	4.00	2.00
Lump sum, dev. wat. sup. and furn. wat. equip.	325.00	900.00	200.00	700.00
50 M. gal. applying water	7.50	2.00	3.50	3.00
14 ton untreated rock base	10.00	5.00	15.00	10.00
10 ton plant-mixed surfacing	16.00	10.00	52.50	20.00
12 cu. yd. Class "A" P.C.C. (structures)	95.00	100.00	100.00	80.00
600 lb. bar reinforcing steel	.25	.25	.20	.30
68 lin. ft. 60-in. R.C.P.	33.50	30.00	30.00	30.00
,040 sq. yd. metal bin type retaining wall	5.10	6.00	5.00	10.00

Reconstruction of storm-damaged slopes along freeways in Los Angeles

California—Los Angeles County—State. Justice-Dunn Co., Oakland, submitted a low bid of $26,122 efore the California Division of Highways for the reconstruction of storm damaged slopes at various ocations on the Hollywood, Santa Ana, Ramona and Arroyo Seco freeways in Los Angeles and South asadena. Work includes excavation, stabilization, plant-mixed surfacing and planting various plants long the slopes. Unit bids submitted were as follows:

(1) Justice-Dunn Co. $26,122
(2) Henry C. Soto Corp. $27,730

	(1)	(2)
,600 cu. yd. roadway excav.	4.50	3.75
120 cu. yd. struct. excav.	8.00	7.00
30 cu. yd. ditch and channel excav.	6.00	6.00
450 cu. yd. backfill matl.	5.00	4.00
900 sq. yd. stabilizing slopes, Type A	4.00	6.00
1 ton commercial fertilizer	150.00	160.00
4 ton straw cover matl. (erosion control)	75.00	150.00
180 lb. seed (erosion control)	.25	.50
100 ea. planting plants No. 1	1.30	1.25
75 ea. planting plants No. 2	1.30	1.25
300 ea. planting plants No. 3	1.30	1.25
,400 ea. plants No. 4	.10	.10
25 ea. planting plants No. 5	2.00	2.50
200 ea. planting plants No. 6	1.30	1.25
100 ea. planting plants No. 7	1.30	1.25
200 ea. planting plants No. 8	1.30	1.25
50 ea. planting plants No. 9	1.30	1.25
100 ton P.M.S.	26.40	27.00
5 cu. yd. Class "A" P.C.C. (struct.)	60.00	50.00
300 lin. ft. chain link fence	2.90	2.95
800 lin. ft. salv. exist. chain link fence	.50	.80
800 lin. ft. reconst. salv. chain link fence	1.00	.90
650 lin. ft. salv. exist. guard railing	1.30	1.00
650 lin. ft. reconst. salv. guard railing	1.30	1.60
335 lin. ft. 8-in. C.M.P. down drains (16 ga.)	3.15	3.00
3 ea. spillway assemblies	42.00	40.00
5 ea. 8-in. C.M.P. down drain elbows	12.00	15.00
300 lb. bar reinf. steel	.25	.35
,100 lb. miscl. iron and steel	.45	1.00
6 ea. control assemblies	11.25	25.00
450 lin. ft. 1-in. galv. pipe (nozzle line)	.70	.65
150 lin. ft. 1-in. galv. pipe (supply line)	.55	.80
130 lin. ft. ¾-in. galv. pipe (supply line)	.45	.65
800 lin. ft. salv. and relay. galv. pipe (water lines)	.35	.80

NEW LITERATURE

1201
Carset Jackbit bulletin

A new bulletin shows the complete range of Carset Jackbits for use with most of the popular threaded connections. Recently issued by **Ingersoll-Rand Co.**, it gives the user an 8-page guide for selecting the right Carset Bit for each job. Form 4146

1202
Couplers for portable pipelines

Quick-Lok couplers is the subject of this 2-color folder by **Wade Manufacturing Co.** Specific job performances are covered by descriptive text and photographs showing how the couplers are particularly adaptable to field use of portable pipe lines. Includes specifications.

1203
100-page catalog on mechanical rubber goods

American Rubber Manufacturing Co. offers a 100-page spiral bound catalog on its line of mechanical rubber goods. Illustrated in color with comprehensive description of each item are transmission, conveyor and elevator belting; industrial hose for water, steam, air, oil, gasoline and beverages; industrial fire hose including reels, racks, cabinets and fire extinguishers; hose fittings; and moulded rubber goods. Valuable addition to each section is contained in one to three pages of data designed to show the proper use of the products to save many dollars in operating costs.

1204
"Heat on Wheels"

. . . is all about **Mortemp Heat Machine Co.'s** portable heating units Models L and H. This 8-page color brochure tells how to solve your heating problems by just plugging in the heater, and in summer using it for cool air distribution. Drawings illustrate its various possible applications. Includes specification tables.

1205
"High strength bolting for structural joints"

The increasingly popular method of using high strength bolting rather than rivets for the assembly of structural joints is the topic of Booklet 342 released by **Bethlehem Pacific Coast Steel Corp.** It gives an account of the research, development and advantages of this relatively new method of assembly, as well as complete specifications for installation, in 16 pages.

1206
Explains "Swintek" dredging ladder

Chock-full of drawings and photographs is this 16-page booklet which gives you the story of "Swintek" dredging ladders. The sketches provide under-water pictures of how the traveling chain on the "Swintek" ladder works; close-up photographs show its structural details, and on-the-spot shots show the dredging ladder in action. Good reading for engineers, contractors and aggregate producers. Offered by **Eagle Iron Works.** Catalog 83

1207
Air compressor catalog

Portable air compressors are the subject of a well-illustrated 28-page bulletin (H-820-B74) offered by **Worthington Corp.** Cross section views of machines, dimensions and specifications are given for sizes 20, 60, 105, 160, 210, 315 and 600-ft. units.

1208
HyPower hydraulic cylinder specs

Turlock Iron & Machine Works offers complete specifications on all ten types of HyPower cylinders. Over 300 different diameters and strokes are available for either air or hydraulic application. Bulletin also gives engineering information . . . formulas for quick and accurate selection of the proper cylinder for various work ranges, and jobs.

1209
Clamping concrete

How to save forming time and cut labor costs by the use of two types of Taper-Tye concrete form clamps is the subject of a new 4-page brochure by **H. J. Krueper Co.** Illustrations and drawings show how these 3-piece clamps are used in concrete construction. Includes specifications.

1210
Cold-feed methods for all bituminous plants

The importance of cold aggregate feed to all types of bituminous mixing plants is emphasized in a 16-page booklet from **Barber-Greene Co.** I lustrating a wide variety of cold-fe methods adaptable to all makes plants, regardless of type or manufa turer, the book gives sound enginee ing recommendations on the sco and advantages of the systems. Fe tured is Barber-Greene's new seri of wheel-mounted, 4-bin feeds. Al illustrated are portable and stationa 2-, 3- and 4-bin hoppers, apron, be and reciprocating feeders, belt co veyors, etc.

1211
Manual and check list for concrete

A unique departure from the standard manufacturer's catalog is being offered by **Gar-Bro Manufacturing Co.** Their 56-page "Manual with Check List for Handling and Placing Concrete" combines approved and authoritative technical information for concrete work along with quick cross-references to the Gar-Bro line of handling equipment. You can check the basic facts about concrete (age-strength characteristics, consistency, admixes, mix designs, etc.) both against your job specifications and against types of equipment available for efficient handling and placing of the material. The reference matter, approved by concrete technicians of the Portland Cement Association, American Concrete Institute, American Society for Testing Materials, Bureau of Reclamation, and the Corps of Engineers, is rounded out with 11 authoritative tables. In addition, Gar-Bro has included specification and job condition check lists for your convenience. These check lists will enable you to determine the most appropriate equipment for your job.

1212
Welding booklet

National Welding Equipment C is offering another of its well-d signed booklets on the subject welding, this one entitled "You do need an egg beater to mix gases . . A summary of the procedure a problems of the field, the booklet al gives a handy order chart for weldi accessories.

1213
"Blue Book" on electric generating plants

D. W. Onan & Sons, Inc., has i sued a blue book of general inform tion concerning the selection of e gine drive electric generating plan Pocket sized booklet describes thr

eneral groups of electric plants: AC, DC, and battery-charged. Plant operation for each type is discussed. Also reviewed are the three types of prime mover—gasoline, diesel and gas engine, with cost of operation and installation facts.

1288

Catalog on hoists

A condensed 2-color catalog containing illustrations, descriptions and specifications for over 100 different types and sizes of portable hoists is now available from **Coffing Hoist Co.** Included are descriptions of ratchet lever hoists, a complete line of standard and specialized spur gear hoists, Quik-Lift electric hoists, Hoist-Alls, and Mighty Midget Pullers. Bulletin CL

1289

96-page catalog on friction materials

Johns-Manville Sales Corp. is offering complete specifications on its full line of brake linings, clutch facing and accessories. This 96-page industrial data catalog includes detailed friction material reference information for every popular make of truck, tractor, ditcher, crane, shovel and scraper. Maintenance men and master mechanics should be especially interested. Put key number on coupon for your free copy. BL-234A

1290

Equipment for logging, loading and roadbuilding

Featuring Caterpillar-Hyster "packaged" equipment for more efficient utilization of machinery on specific jobs, Form 1262 by **Hyster Company** illustrates the use of logging, loading and road building equipment with actual on-the-job operations in different parts of the world. Equipment includes logging arches, winches, yarders, donkeys, earthmoving, loading and road building machinery.

1291

Tells about steel scaffolding

Brainard Steel Division, Sharon Steel Corp., is offering a 4-page bulletin on its steel scaffolding system. Numerous photographs show you how to assemble the scaffolding tower and illustrate the varied construction and maintenance applications for which it is useful. This simple, useful type of scaffolding is made up of only one basic part and requires no nuts, bolts, pins or tools for erection.

1292

For simple surveying

Henry Wild Surveying Instruments Supply Co. of America, Inc., is offering a little booklet giving a comprehensive story of the operating principles of optical squares and their many practical applications in construction, layout and surveying. Anyone with either an occasional or regular use for surveying instruments should be interested in finding out all about these handy little tools.

1293

Hydraulic and pneumatic applications by Rucker

Pictures and text give you the story behind 15 typical hydraulic power unit installations for engineering and manufacturing by the **Rucker Company,** specialists in fluid power systems. Some of the examples are Rucker-built units which control opening and closing of intake gates at McNary Dam, a hydraulic stand for testing reworked transmissions, differentials and transfer cases at Benicia Arsenal, control cabinets for intake gates at Ross Dam, and a power unit and control panel built to power a hydraulically-operated billet shaver.

1294

Getting rid of ice on streets and highways

What the Spreadmobile can do toward taking care of slippery streets in wintertime is contained in a new bulletin describing the improved features of this machine. Exclusive "Center Spread" design, which spreads sand, cinders, calcium chlo-

ride, etc. from the center of the body under all 4 wheels for improved traction and complete visibility of spread pattern, is fully explained. This Bulletin No. A-370-H is offered by **Baughman Manufacturing Co.** Get a free copy by putting key number on coupon.

1214

New tractor-shovel catalog

Model HR 4-wheel-drive "Payloader" tractor-shovel is the subject of a new 16-page catalog from the **Frank G. Hough Co.** It contains action views of the 1-cu. yd. machine doing earth and materials handling jobs for city, county and industrial plant projects. Pictures and detailed specifications of all seven sizes.

1215

Logging catalog offered

Featuring Caterpillar-Hyster "packaged" heavy equipment, a catalog from **Hyster Co.** illustrates the use of logging, loading, and road building equipment with actual on-the-scene operations. Equipment includes logging arches, winches, yarders, donkeys, earthmoving, loading and road building machinery. (Form 1262)

1216

36-page welding catalog

National Welding Equipment Co. offers 36-page welders equipment catalog (CW 19-5) giving specifications and operating data on the complete line of National torch tips, torches, extensions, regulators, gauges, valves, hose connections, adapters and accessories. Selector charts give unit recommendations for various work ranges.

1217

Portable vibrating screen described

Hewitt-Robins, Inc. has booklet (122-J) describing the Vibrex vibrating screen which is especially recommended for use in small quarries, roadside contractors' plants, cinder block plants and building construction jobs. Pictures of screen in various applications, and dimension charts included.

1218

"Bury Your Bridges

. . . to Make Them Better" is the title of the **Armco Drainage & Metal Products, Inc.'s** folder on its corrugated metal pipe and pipe arches. It offers a modern answer to the replacement of obsolete bridges with an eye to future expansion, and less maintenance cost. Pictures show Armco bridge structures in single and multiple units.

1219

Loading equipment sheets

Four new catalog pages, with price lists, on Lebus tail chains, "Bulldog" load binders, all-purpose snatch blocks and industrial hooks, and "missing links" are available from **Lebus Rotary Tool Works.** Made of drop-forged, heat-treated steel the Lebus products are guaranteed by the manufacturer against failure in service for which they are designed and recommended. (450-100A-1000-300)

1220

Power shovel and crane info.

Just released by **Thew Shovel Co.** is a new 12-page illustrated bulletin describing the Lorain "80" series of power shovels and cranes. Design and construction features are given on the 1¾-yd. class shovel, as well as air controls, and choice of crawler sizes and front-end equipment for the series.

1221

Bulletin on concrete forms

Steel forms for building concrete curbs, gutters, and sidewalks are discussed in the **Heltzel Steel Form and Iron Co.'s** booklet L-20. Interchangeable face, build-up, heavy-duty, dowel, two-piece rigid radius, specials such as island forms, etc., are described and illustrated both in sectional and in complete units.

Literature briefs . . .

1222

FACINGS—Master facing problems on your tractors or truck clutches are answered in new literature by **S. K. Wellman Co.**, manufacturers of Velvetouch matched facing sets.

1223

HOISTS—Free literature on its line of hoists and hoist parts is being offered by **Superior-Lidgerwood-Mundy Corp.**

1224

JAEGER LOADER—The 1-yd. Jaeger Load-Plus is featured in Catalog L100-3 by **The Jaeger Machine Co.** Gives you all the facts about its top performance characteristics.

1225

GALION 118 GRADER — **Galion Iron Works & Manufacturing Co.** is offering literature on its Model 118 grader. Tells about its easy handling features, 6-wheel flotation, all-gear tandem drive and other pertinent features.

1226

TILT-UP CONSTRUCTION—For more efficient handling of tilt-up concrete slabs, here is Bulletin TU-2, offered by **Superior Concrete Accessories, Inc.**, on its "Pick-Up" insert, "Anchor" insert, and slab brace.

1227

ROADRANGER—For complete information on the Fuller R-45 Road-Ranger one-stick transmission, **Fuller Manufacturing Co.** is offering new literature about the unit's 8 forwa speeds and 2 reverse speeds f smooth operation of 125/160-hp. rig

1228

SNOW PLOW—**Wm. Bros Boiler Manufacturing Co.** is offering a fold on its new Series "A" Sno-Fl Rotary with its non-clogging sl spiral rotor for speedy snow remov

1229

PAVING—"Put a Level on Yo Roads" is all about the Adnun bla top paver, a unit featuring an Osc lating Screed and a Fluid Level f uniform thickness and density. C fered by **Blaw-Knox Co.**

1230

SCHRAMM PRODUCTS **Schramm, Inc.**, is offering Catal 5350 on its line of air compressors a pneumatic tools, including rock dril paving breakers, wagon drills, bac fill tampers, the Pneumafeed, Pne majack, and Pneumadriver, and shee ing drivers and clay spades.

1231

CONCRETE FORMS — Pertine information available about **Unive sal Form Clamp Co.'s** line of concre forming equipment, including U Form panels, described as the mo ern forming system; Spiroloc for ties; the Form Clamp; "Strip-Eas snap ties; "Twistye" snap ties, a various other concrete accessories.

1232

ARC WELDING—"Studies in Stru tural Arc Welding," by **Lincoln Ele tric Co.**, tells you how to use a welding in the construction of rig frame-type buildings and other stru tures.

1233

HYSTAWAY—Catalog 1235 is about the Hystaway, described as t only machine for doing excavato crane work as well as bulldozing a other tractor operations. Offered **Hyster Co.**

1234

STEEL FORMS—Here is new lite ature on the uses of Universal ste forms for economical construction concrete curbs, curbs and gutte integral curbs, or sidewalks. Bullet 2259 by **Blaw-Knox Co.**

1235

STONE GRAB—Find out how t Wellman Stone Grab will help y get rid of the clumsy large stones the site of your job. Free bulletins **Wellman Engineering Co.** on sto and wood grabs, clamshells, draglin and custom-built buckets.

1236

PRESSURE PIPE—"Mains Wit out Maintenance" is all about **Kea bey & Mattison Co.'s** "Century" a bestos-cement pressure pipe for du able, economical installations. Val able data, specifications and referen

naterial for those interested in water nain pipes.

1237

SAW SPECS — Complete specifications for the 22 standard models of Comet radial saws are being offered by **Consolidated Machinery & Supply Co., Ltd.**

1238

CONCRETE POURS—How to prevent leakage between concrete pours by nailing in ribbed and grooved polyvinyl plastic Labyrinth Waterstops in the joints. Send in for full information and a sample. **Water Seals, Inc.,** is manufacturer.

1239

TAGLINE — **Westfall Automatic Tagline** has a free folder about the top features of its 5 sizes of center-pull automatic tagline and magnet control reels.

1240

LUBRICANT—**Lubriplate Division, Fiske Bros. Refining Co.,** has a 56-page "Lubriplate Data Book" on its lubricant for improving the operation and reducing maintenance costs of your construction equipment.

1241

RUBBER TIRES — "How to Get More Recaps Out of Truck Tires" tells you about **B. F. Goodrich Co.'s** rugged rubber tires, reinforced with an exclusive nylon shock shield, for heavy, off-the-road hauling.

1242

WELDING CATALOGS—**Air Reduction Pacific Co.** is offering an Electrode Catalog and Gas Supplies Catalog on its line of ferrous and nonferrous electrodes, hardfacing alloys, gas welding rods, fluxes, and silver brazing alloys and fluxes, to answer your questions about welding supplies, accessories and equipment.

1243

PUMPS—Find out about **Gorman-Rupp Co.'s** self-priming centrifugal pumps ranging in capacity from 1,000 gal. per hr. to 240,000 gal. per hr. Bulletin 8-CP-11

1244

COMPRESSOR — The Gardner-Denver 600 air compressor with a 600-ft. capacity is the subject of Bulletin PC-12 by **Gardner-Denver Co.**

1245

VIBRATORS—Here is a circular by **White Manufacturing Co.** on its line of vibrators with interchangeable drive sections and vibrator heads.

1246

FILTERS—Get a complete description of Winslow "CP" (controlled-pressure elements) which have an exclusive built-in system enabling all lubricating oil (hot or cold) to get full-flow filtration. Available literature by **Winslow Filters.**

1247

VIBRATORS AND SCREEDS—All the facts about **Stow Manufacturing Co.'s** concrete vibrators and screeds are contained in this Bulletin 526.

1248

WOOD PRODUCTS—Pertinent information about Monocord timber trusses and other structural timber products is contained in the structural wood products catalog by **Weyerhaeuser Sales Co.**

1249

PAVER—How to cut time and costs with Dotmar self-powered curb and gutter pavers is explained in a bulletin published by **Dotmar Industries, Inc.**

1250

TRENCH ROLLER—Specifications for the Apsco dual-compression trench roller are being offered by **All Purpose Spreader Co.**

1251

V-BELT DRIVES—Bulletin V-215 by **Flexible Steel Lacing Co.** answers your questions about Alligator V-Belt drive units.

1252

BELT FASTENERS—**Flexible Steel Lacing Co.** has released Bulletin HF 500 on its Flexco hinged belt fasteners for joining earth moving conveyor belts.

1253

PORTABLE HEATER—Complete information is available on the "Eco-Temp" LP gas portable heating unit with automatic firing. Released by **Arthur C. Baumann.**

1254

PULLEY—**Yuba Manufacturing Co.** has a folder on its Schrock motorized head pulley for belt conveyors and bucket elevators.

1255

POWER UNIT—The 500- to 40,000-watt KATOlight light and power plants are the subject of Bulletin No. 653 by **King-Knight Co.**

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More information on any o the items in this section ma be obtained by using coupo on page 113.

1256

Series A Sno-Flyr joins Bros snow plow team

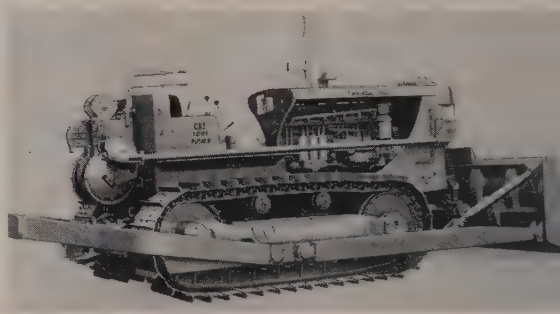
Newest member of the **Wm. Bros Boiler and Manufacturing Co.** rotary snow plow line is the new Series A Sno-Flyr. It can be mounted on the front-end hydraulic loader of the industrial wheel-type tractor, utilizing the same pins and connections and needing no extra braces or drilling. Its snow removal capacity is 3 to 4 tons per min. in average snow conditions. It was designed for any job too big for sidewalk units and too small for the big truck units. A bucket tilting device provides positive operating control on plow and engine at different elevations. The special loading chute allows truck loading on either side

of the plow, and its casting chute, which can be rotated through an arc of 180 deg., permits spot casting of snow in confined areas. It disposes of wet, heavy snow because of the quick and positive action of the rotor-feed rake; as the moldboard area fills, the snow is hurled up and out of the casting chute. A special capping device can be added to control the height of the ejected snow stream. The unit is available in three models with plowing width of 6 ft., 6 in.; 5 ft., 6 in.; and 4 ft., 6 in.

1257

Cat announces D8 pusher tractor for heap-loading large scrapers

A D8 pusher tractor has been adapted and equipped specifically for pusher loading work. The new machine, a modified version of the Cat D8 tractor complete with 150 drawbar hp., No. 8S bulldozer blade and No. 25 cable control, was developed to heap-load large scrapers.

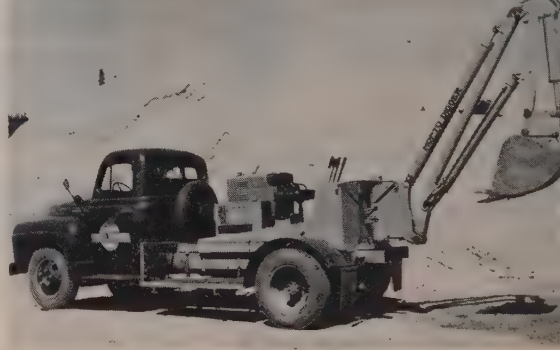


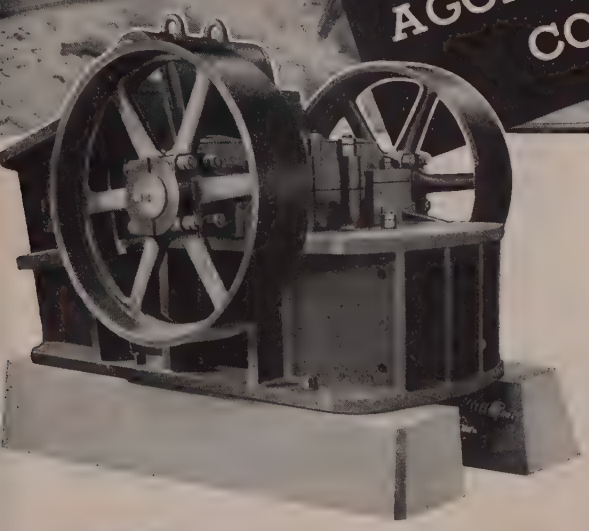
Four special features of the new pusher tractor inclu a more powerful engine, modified to produce 150 drawb hp. at 1,200 rpm., increase of weight to 50,025 lb., bulldoz and cable controls for inline pushing action and clean-u of cut, and a new transmission especially designed f pushing work. Of special note is the new tandem push frame attachment, which permits transfer of power fro one tractor to another through the track roller fram thus avoiding highly destructive stresses on the lead tra tor's final drive. Manufacturer is **Caterpillar Tractor C**

1258

Hopto adds mobility to digging operations

Hopto, which is completely hydraulic in operation, h eliminated cables, sheaves, chains and sprockets in i newly redesigned Model 120TM-53. This truck-mount digger, which may be powered by water- or air-cool power units or driven by the power take-off of the truc has a digging depth of 11 ft. It also has a choice of buck and back hoe widths of from 8 to 38 in., which enab





A Traylor Jaw Crusher on the job site puts you in complete control of your aggregate supply. You control the source . . . the delivery . . . the quality . . . *and the cost* of job-produced aggregate. Original Traylor features . . . curved jaw plates . . . heavy-duty construction . . . more efficient application of power . . .add up to greatly reduced operating costs for longer periods of maintenance-free operation. Get full information on a Jaw Crusher "Traylor-Made" to control your aggregate costs.
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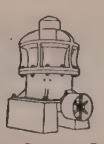
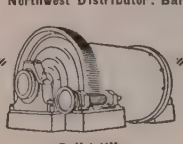
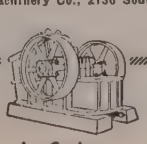
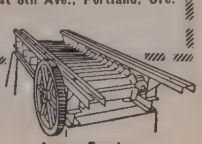
Primary Gyratory Crushers


Rotary Kilns


Secondary Gyratory Crushers


Ball Mills


Jaw Crushers


Apron Feeders

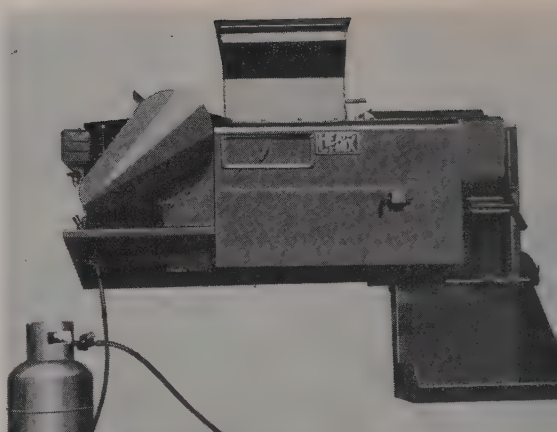
Hopto to be adapted to a wide variety of digging applications. The main frame of the unit is of formed plate which partially shields the operator and permits enclosure for adverse weather conditions. Relief valves cushion stops and starts on the 200-deg. arc of the boom swing. A new improved heavy-duty oil filter and a 40-lb. pull magnet in the oil supply system are other features that make for longer unit life, according to the manufacturer, **Badger Machine Co.** The unit may be mounted on a truck that has already served its heavy-duty service, provided it is in good enough repair to serve as a mobile mounting for this unit.

1259

Tailgate mixer heats and remixes stockpiled material

Heat-A-Mix, a new product of **Wiley Manufacturing Co.**, was designed for the heating and remixing of stockpiled asphalt patch material. It is a compact, high capacity pugmill and material heater mounted on a tailgate panel, which can be attached to a dump truck for maintenance operations. It has its own gasoline engine and propane heating system. The patch material can be carried on a dump truck and discharged directly into the pugmill when the damaged area is reached. The asphaltic material is thoroughly mixed and heated in the pugmill before being discharged into the material catchpan or onto the road surface. When the repairs are completed, Heat-A-Mix is removed, making the truck available for regular dump service again.

Specifications include a capacity output of 10 tons per hr., weight 1,000 lb., length 86 in., height 28 in., depth 22 in., and the pugmill, which is 48 in. long, has 30 mixing blades. The firebox is constructed of 10-gauge sheet steel



and has an insulated combustion chamber. The hot mat rial pan is hinged to be raised when not in use or whe the truck is traveling.

1260

Two new models added to Lorain Moto-Crane line

Model MC-254W, with a lifting capacity of 17½ ton and Model MC-424, with a lifting capacity of 22½ ton have been added to the line of Lorain Moto-Cranes b **Thew Shovel Co.** Model MC-254W is a 3-axle crane avai able as a ¾-yd. shovel, crane, dragline, clamshell, or ho or a 1¼-yd. scoop shovel. Its over-all width is 106 in., an

: has a maximum boom length with tip extension of 95 t. It has 8 forward speeds and 2 reverse speeds and can ravel up to 37 mph. Either diesel or gasoline power can e used for its turntable and carrier. Model MC-424 is a -engine machine with a gasoline-powered turntable or uperstructure mounted on a 3-axle carrier, with drive on he two rear axles. It has 10 forward speeds and 2 reverse speeds up to 27 mph. The carrier has an overall width of 96 in., and a maximum boom length with tip extension of 125 ft. It is convertible to shovel, crane, clamshell, dragline, or hoe booms. It may be equipped with diesel power for turntable, third drum, power load lowering, front wheel brakes or other purposes.

1261

Ten-ton truck is fast, maneuverable and dumps in 10 seconds

A fast, heavy-duty, highly maneuverable truck for construction and quarry work is the rugged Model 10-S, a 10-ton machine with 6½-cu. yd. capacity (struck), and 10-sec. dumping speed. For top performance the manufac-

turer has utilized many of the design features found on its larger models. These include the box-section frame which is used on its large ore-hauling trucks. The forward one-man cab is reported to provide more driver visibility than any other truck of its type. A 100-in. wheel base assures maneuverability in close quarters—Model 10-S turns in a radius of less than 20 ft. Its 6-cylinder Continental RD6572, 156-hp. diesel engine assures high speed with full load, giving it the highest hp. rating of any comparable truck in its class. The hoist is a twin, 6-in. diameter, double-acting, single-stage unit which raises to a 60-deg. dumping angle. Additional feature of this new truck is its front end suspension. The front springs are extra long for easy riding, and 2-stage springs are provided in the rear. Manufacturer is **Dart Truck Co.**

1262

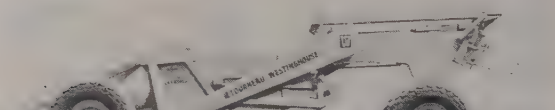
Paving joint sealer for airports resists jet exhaust blast and fuel spillage

A cold-applied, vulcanizing-rubber concrete paving joint sealing compound, described as resistant to jet exhaust blast and fuel spillage, has been developed by **Presstite Engineering Co.** for maintaining sealed paving joints in airport runways and aprons. The new product, called No. 99, has also been used on a new high speed automobile test track. It is described as having the following characteristics and advantages: Heating time and danger of burns to workmen are eliminated since it is mixed and applied cold; its high bond and extensibility allow it to withstand repeated expansion-contraction cycles of the pavement; it is resistant to high-speed impact of heavy

loads; super-elevated temperatures will not cause it to soften or flow; it remains pliable and will not crystallize at low temperatures, and it can be quickly mixed and rapidly applied in practically any atmospheric temperature.

1263

LeTourneau-Westinghouse announces scrapers with 10.5 to 28.5 cu. yd. capacity



A new line of open-top, tractor-drawn, rubber-tired scrapers, ranging in capacity from 10.5 to 28.5 cu. yd., has been announced by **LeTourneau-Westinghouse Co.** These scrapers are available in four sizes. The O-14, designed for use with tractors of 70 hp. or more, has a struck capacity of 8.1 cu. yd., and a heaped capacity of 10.5 cu. yd. The O-19, for use with 75 plus hp. tractors, has a struck capacity of 12.2 cu. yd., and a heaped capacity of 16 cu. yd. The O-23, for 80 plus hp. tractors, has a struck capacity of 14.4 cu. yd., and a heaped capacity of 19 cu. yd. The O-35, for 100 plus hp. tractors, has a struck capacity of 22.5 cu. yd., and a heaped capacity of 28.5 cu. yd.

These scrapers are of welded construction throughout, and their design facilitates shovel or conveyor loading by elimination of overhead cables. Other features include positive ejection of material; heavy-duty roller bearings; a hard-surfaced, self-sharpening, reversible blade; replaceable side runners; machine-grooved, heat-treated cable sheaves, and wheels mounted inside the blade's cutting edge.

1264

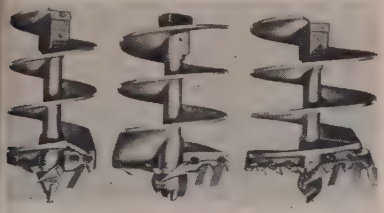
Sand and cinder spreader designed for ice control

Complete one-man operation is a feature of the new SC sand and cinder spreader for ice control. The streamlined body contains many features which produce both a better spread pattern and have helped eliminate mechanical failures. The new fifth wheel drive eliminates the individual practices of different drivers, being governed only by the ground distance traversed by the truck. An auxiliary gas engine, with its controls right in the truck cab, regulates the distributor speed and width of the spread. The split-bottom dump allows the spreader body to be used for many of the general uses of a dump truck. Manufactured by **Baughman Manufacturing Co.**

1265

ersatility keynoted on new eries of flight augers

A new series of flight-type earth ugers has been especially developed or jobs where there are many holes f the same size to be bored, or where ub-surface material is very loose or ry. Additions to the PENGO line of arth boring tools by **Petersen Engineering Co.**, these augers, now avail-



able in 16-, 20-, 22-, and 24-in. diameter hole sizes and to be offered in additional sizes if demand warrants, fit all heavy-duty boring machine makes. Feature of the new series is a special single-helix design that retains the double cutting characteristics of twin-helix augers but has special spiraling which holds the flights nearly level, thereby preventing loose material from running back into the hole. Added carrying capacity also is obtained from its additional flights, enabling completion of a hole with fewer trips in and out. Petersen's new heavy-duty boring machine models will supplement their PENGO twin-helix flight auger series in contractor and utility field use. They are offered in standard 26-in. lengths and also in 34-in. lengths to permit ground clearance on machines mounted unusually high.

1266

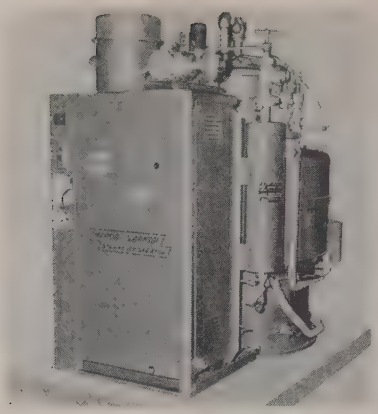
Two-cylinder diesel ideal as auxiliary engine

The new Model 17, a 2-cylinder full diesel engine develops 20 hp. at 2,000 rpm., and is well within the price range of comparable size gasoline engines. The compact size (33 in. long, 22 in. wide and 31 in. high) permits installation of this diesel in existing equipment with few design changes. Economical to operate, it is reported to be ideal for use as the auxiliary engine on "mix-in-transit" cement trucks and other equipment. Manufacturer is **R. H. Sheppard Co.**

1267

Combination oil and gas fuel steam generator available

The new Vapro-Clarkson steam generator Model OKJ-4740 can change from fuel-oil to natural gas fuel by flipping one switch and without interrupting steam output. For the construction industry, a source of 150-psi. steam is available for concrete block plants, portable power plants, cranes, pile driving hammers, curing concrete in dams, and for as-



phalt plants. Specifications for this machine are as follows: It develops full working steam pressure up to 300 lb. in less than 3 min. from cold water, and makes 1,500 to 5,000 lb. of steam per hr. Weight is about 6,000 lb.; width, 50 in.; height, 80 in.; length, 73 in. Once started, by turning one switch, automatic controls take over so that the steam generator turns on and off and modulates steam output to meet a changing steam demand. This Model OKJ-4740 is a complete pre-tested package which includes a 7½-hp. electric motor, blower, feed water pump, steam separator, steel coils, and all the controls, in a trim cabinet. Manufacturer is **Vapor Heating Corp.**

1268

Time-saving Size 2U Impactool introduced

Ingersoll-Rand Co. has announced a new Size 2U electric Impactool. Designed to save time and effort on such jobs as nut running, tapping, screw driving, reaming, and drilling, and rated for nut running up to ¼-in. bolt size, the new tool automatically delivers a series of powerful rotary blows to the work when resistance to turning is met, without kick or twist to the operator. Some of its trouble-free characteristics are as follows: The motor cannot be burned out by overloading, and will operate from any 110-volt source, AC (60, 50, 40 and 25 cycles) or DC. The practically frictionless ball and cam Impact Mechanism converts the full motor power to useful work with low current consumption and less heating. Accurate Impact Mechanism and motor armature alignment is assured by separate grease sealed ball bearings, which need no attention. The whole tool is accurately balanced for operator comfort, and is designed for easy operation even with greasy hands. It is available as a bare tool or in various general service kits, and is the latest in Ingersoll-Rand's complete line of electric Impactools, with larger sizes available for work to ⅜-, ⅝-, and 1¼-in. bolt size. This 5-lb. tool should find wide use in electric motor and small gasoline engine repair, sheet metal work, equipment installation and repair, and many general maintenance applications.

1269

Angular bolt cutter designed for flush trimming bolts

A new Guillotine hydraulic angular bolt cutter has been designed for flush trimming bolts to the nut or for other metal trimming jobs where a close cut is desired. With a capacity for trimming ⅞-in. mild steel bolts, it can also be obtained with cut-back jaws for use in splitting nuts during wrecking operations or for trimming wire mesh. A portable hydraulic pump supplies the power for the unit, which is actuated by a manual lever eliminating the necessity of solenoid switches. Its cutting head weight is 23 lb. Manufacturer is **Manco Manufacturing Co.**

1270

Improved chain saws give greater power punch

Two new, improved models of Titan power chain saws are said to incorporate all of the manufacturer's standard engineering features, plus many important advancements in design. Power and cutting speed have been increased in the Titan 45 and 65. Larger bores and high baffle pistons give the greater power punch, which, combined with the new, faster-cutting, streamlined Titan "BlueJet" chain, assure top cutting speed. Cooling capacity has also been stepped up considerably in these models. Engines on both units will operate at a 90-deg. tilt in any direction. A square transmission handle assures stability while starting. Titan Series 45, the smaller of the two saws, is available as a one-man unit with bars ranging from 18 to 44 in., or as a bow saw with a 16-in. capacity. Titan Series 65 is offered as a two-man or one-man unit, with bars ranging from 26 to 60 in., or as a bow saw with a 24-in. capacity. Manufactured by **Titan Chain Saws, Inc.**

1271

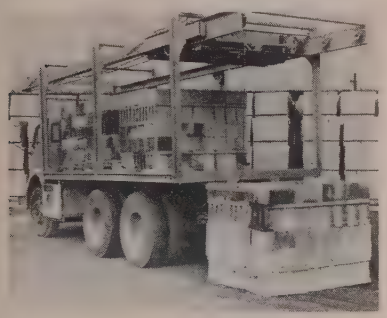
ransmission for 125/160-hp. ighway rigs

A new unit in the ROADRANGER eries transmission, the Fuller R-45, ssures 8 speeds forward on highway igs in the 125/160-hp. class—those elivering up to 385 lb. ft. of torque. he 8 forward speeds are secured by sing a 4-speed shifting pattern twice, he first time with the auxiliary section in low gear or low range, the second with the auxiliary section in high gear or high range. The R-45 attains one-lever ease by a synchronized electric-air power shift between ranges, the synchronized range shift occurring automatically as the shift lever moves through the neutral position. It results in ⅓ less shifts for the operator; eliminates gear-splitting; enables more weight to be carried over the payload axle; maintains highway speeds on the hills, with greater fuel economy. Manufacturer is **Fuller Manufacturing Co.**

1272

Material handling truck body for loading concrete blocks

Only one man needs to handle the new Bros LECTRO-LIFT material handling truck body. Ideal for concrete block producers, the machine

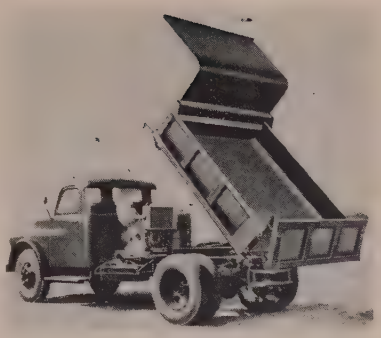


permits blocks to be loaded directly from the stockpile. For unloading, blocks can be unloaded into excavations down to 8 ft. below ground level. And it only takes 8 min. to unload a LECTRO-LIFT bed carrying 432 eight-inch blocks. Simple, foolproof carriage hooks extend down from a traveling carriage mounted in a structural heavy-duty steel frame. It is reported that handling the blocks can be accomplished without breaking, chipping, or damaging. Manufacturer is **Wm. Bros Boiler & Manufacturing Co.**

1273

Air compressor-dump body truck announced

Davey Compressor Co. and **Galion Allsteel Body Co.** are announcing jointly the Davey Model 105 "Auto-Air" unit and a Galion Model 12 contractor's body. The 2-stage air-cooled compressor delivers 105 cu. ft. per min., is driven direct from the truck engine by a Davey heavy-duty power



take-off, and occupies less than ¼ of the truck body space. The dump body is of high tensile steel, is 90 in. long and 78 in. wide, with 15-in. sides and 21-in. ends. Box-type side braces, full size compressor protector, fabricated steel hardware, and extra-heavy rear corners are additional features. Raising and lowering is handled by a Model 700 Galion Allsteel hoist with patented fulcrumatic action. Both compressor and body are suitable for mounting on a wide range of standard motor trucks.

1274

Automatic compaction tests on soils and soil-cement mixtures

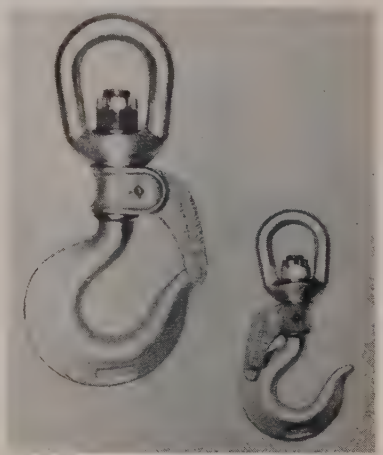
Here's a new soils compaction machine that operates automatically. A rammer delivers to the test sample the desired number of blows up to 100 as preset on a counting mechanism. The length of fall of the ram-

mer can be set to any height from 0 in. to 30 in. Because the operation is automatic, the operator can give full attention to his manual rotation of the sample. Single blows may be struck with counter disengaged. Sturdily constructed, and equipped with an electric motor, this machine is manufactured by **Microchemicals Specialties Co.** Trade name, "Pantec."

1275

Hook locks automatically, opens when it's supposed to

Here's a hook with a "safety gate" which locks automatically and will not open unless the pin is manually depressed. This feature makes it lit-



erally impossible for a load to slip off the hook. The new design uses the hook shank as its operating base yet does not obstruct the throat of the hook. The rustproof gate, which can be adapted to fit all makes and sizes of standard hooks, opens and closes with ease in all types of weather. It swings open horizontally on the shank axles so that even a full hook load will not snag in loading or unloading operations. Literature available to give all pertinent information. Manufactured by **E. D. Bullard Co.**

1276

Provides protection for hot underground pipes

GILSULATE, a blend of specially sized and selected Gilsonite, a unique solidified petroleum found only in the Uintah Basin of eastern Utah, both insulates and protects hot underground pipes from corrosion. When poured around a hot underground pipe, a layer of GILSULATE melts and is fused to the pipe. It provides a triple zone of protection for the pipes, assuring permanent protection against such commonly encountered corrosive factors as alkaline ground waters, electrolysis, root attacks and bacterial action. In contrast to present practices, this new product does not require sleeves or sheaths to protect the insulation; rocks need not be removed from the backfill to avoid puncturing the insulation, and there

, no need for expensive complex oncrete ducts around the pipe. Where required, repairs or changes an be made quickly and easily by emoving the backfill and chipping ff the GILSULATE. Because of its igh insulating efficiency, hot and old lines may be buried in the same litch, as well as lines carrying steam .t different temperatures. Available n three grades to meet the needs of most hot underground lines: Type A, or temperatures ranging from 220 to 310 deg. F.; Type B, from 300 to 385 deg. F.; and Type C, from 385 to 520 deg. F. These three grades have a different initial melting point. Literature available on request from **American Gilsonite Co.**, manufacturer.

1277

Reversible ripper adjustable for 8- to 16-in. digging depth

This new ripper by **Kritzer Equipment Co.** makes fast work of ripping in most type formations including sandstone, decomposed granite and hard pan. Mounted directly on the tractor and adjustable for digging depth between 8 and 16 in., the ripper can be set to operate automatically while the tractor is either in forward or reverse motion. A standard ripper tooth is used and may be installed for either side or draw-bar mounting. It rips straight, being guided by the course of the tractor itself.

1278

Tough abrasive blades for safe masonry saw operation

The Target Safety-Blades will readily take severe flexing, side pressures, and bumping while in operation, according to the manufacturer, unlike ordinary abrasive blades, because of an entirely new reinforcing process which moulds a strong center core of strongly woven synthetic fabric. A variety of specifications are now being manufactured to provide fast, economical cutting of brick, stone, concrete blocks, tile and refractories. The cutting action of these masonry blades is claimed to be extremely free and fast. Three different blades are available for hard; medium; and for soft, coarse or abrasive materials. Manufacturer is **Robert G. Evans Co.**

1279

Electrode serves as new source of instant heat

A new steel core electrode, the ThermoTrode, will provide a new source of instant heat where and when needed, for quick heating, for annealing, heat treating, softening, and for countless other uses where the acetylene torch is impractical or impossible. No special equipment is necessary to operate the ThermoTrode. It is inserted in an ordinary electrode holder of a DC arc welder and is ready to work. Featuring a specially developed patented flux which establishes a unique type of arc, instead of depositing the metal it actually oxidizes the metal with a searing blast so that the core metal disintegrates into a powder which can be easily brushed off. This new electrode is said to be adapted to almost every phase of welding operation where a concentrated heat source is needed; plus that, it has the added advantages of speed and availability without the need for introducing other heat sources such as torches, furnaces, or ovens. It is available in 1/8-, 5/32-, and for heavy work, 3/16-in. diameters. Manufacturer is **Eutectic Welding Alloys Corp.**

1280

Two new model saws for concrete cutting

Champion Manufacturing Co. has designed the CS-500 and the CS-400 saws for cutting all types of asphalt and concrete highways and streets,

and also for cutting joints in concrete flooring and for patching and trenching work. The CS-500 is equipped with a 14.6-hp. air-cooled gasoline engine, and has dual blade guards with 14-in. blade capacity. The CS-400 has an 8.4-hp. engine with each blade guard having a 12-in. blade capacity. Both machines have dash board controls, positive screw feed, depth lock, non-sway rubber-tired wheels, and other features designed for easy operation, maneuverability and maintenance.

Equipment briefs . . .

1281

SNOW PLOW FOR JEEP—**Willys Motors** reports that a new plow attachment for its famous jeep will throw snow 40 to 70 ft. off clogged highways. The new plow is of the rotary type, and it can operate effectively in deep snow at speeds up to 20 mph. The plow is removable from the jeep, and has its own auxiliary 72-hp. jeep engine in the rear, although its operation is controlled from the driver's seat.

1282

TWO-SPEED AUXILIARY TRANSMISSION — **H. S. Watson Co.** has available a new two-speed auxiliary transmission to supplement the firm's line. The new unit, called the "Brownie Junior," is available either as an overdrive or as an underdrive, and is especially designed for light-duty and pick-up trucks. Complete installation kits with instructions for all popular truck makes.

1283

COMFORT FOR TRACTOR OPERATOR—New model heaters custom fit for crawler tractors and designed to accommodate dozers and other generally used equipment now are available to fit Allis-Chalmers, International Harvester and additional Caterpillar tractor models. The manufacturer, **Comfort Equipment Co.**, states that it is not necessary to cut holes in the heater to reach starting motor, oil sticks or other parts.

1284

PENTACHLOROPHENOL PROBE—A kit of materials for determining the amount of pentachlorophenol in an oil solution is available without charge to inspectors and users of penta-treated wood from **Wood-Treating Chemicals Co.** If you can qualify, put key number on coupon for your free kit.

1285

CIRCLE TURN FOR GALION 503 GRADERS—The economy-size Model 503 Galion tandem drive motor grader is now available with a hydraulic-powered circle, which is actuated by a powerful heavy-duty hydraulic motor. Of compact and rugged construction, the circle rotation is controlled by a simple movement of a lever on the operator's platform. Its turning range is 140 deg. Use of the circle turn is claimed to speed up ditching and windrowing operations. Manufacturer is **Galion Iron Works & Manufacturing Co.**

1286

NEW TYPE GROUSER SHOE—Grouser shoe design for crawler tractors has been given a new wrinkle by **Engineered Equipment Co.** Known as the Gripper, this new product is reported to give the following advantages: better traction, increased resistance to side slipping, improved flotation, greatly increased strength, and bolt heads protection. Grouser ends are reinforced and renewable re-grousing bars are also available. Made of 13% manganese steel.

1287

ALL TEMP LUBRICANT—A new lubricant which performs effectively in temperatures ranging from minus 65 deg. F. to plus 125 deg F., has been developed by **The Texas Co.** This new grease possesses the following characteristics: good low temperature operation, excellent shear stability which prevents leakage in tropic heat, high oxidation resistance which imparts long life, good rust and corrosion protection for metal parts, and the capacity to perform even when contaminated with water.

High-strength bolts used in steel structures

HIGH-STRENGTH bolts are becoming more prevalent on large building projects all up and down the Pacific Coast these days in place of ordinary bolts or rivets. Current projects on which the bolts are being used to join and hold the structural steel members include the new Schlitz Brewing Co. plant at Van Nuys, California, the new Ford Motor Co. assembly plant in Milpitas, California, and the new 550-ft.-high television transmitting tower of Station KOMO-TV in Seattle.

Fabrication and erection of both bolts and structural steel is in the hands, for the most part, of Bethlehem Pacific Coast Steel Corp.

One of the most important factors in the use of the new bolts is that satisfactory control and measurement of torque is possible at the compressor which drives the impact tool used to run down the nuts. After initial adjustment, two-man bolting crews can proceed faster, easier, and safer than with riveting, and a much greater clamping force results. Maintenance costs are also substantially reduced because connections stay tight indefinitely with this type of bolt.

Since all high-strength bolts are required to be torqued to at least 90% of their elastic proof load, the impact wrenches must be calibrated to produce the proper tension on the bolt within a 10- to 15-sec. period. When the nut has been torqued to get a predetermined bolt tension value, the wrench is calibrated to stall. A gauge at the hydraulic jack shows the amount of tension in pounds applied on the bolt by the impact wrench.

There will be about 20,000 high-strength bolts used to join the 1,600 tons of structural steel at the new Schlitz Brewery. The bolts are ⅞ in. in diameter. The nuts are screwed on with an operating air pressure of 65 to 80 lb. psi. in the impact wrench. Some 35,000 lb. tension is used on each bolt.

More than 3,000 high-strength bolts are being used in the new television tower in Seattle. Here too, the procedure calls for hardened washers under head and nut, permitting development of a very high torque without scoring the connected structural steel members. This clamping pressure gives it a connection which will hold against shearing forces and under continued heavy vibration.

At the new Ford Motor Co. plant at Milpitas, more than 7,400 tons of structural steel and 50 tons of high-strength bolts will be used.

Las Vegas plans for power

PLANS are being made for construction of a $5,500,000 steam plant at Las Vegas, Nev., by the Southern Nevada Power Co. Preliminary surveys provide for installation of four 30,000-kw. steam generating units, one at a time, as needed.

New hydro project for California-Oregon Power

CALIFORNIA-Oregon Power Co. has been issued a 50-year license for a proposed hydroelectric project on the Klamath River in Klamath County, Ore.; the project will be called Big Bend No. 2.

Estimated cost of the project is $9,000,000. This would include a 52-ft.-high, 310-ft.-long diverson dam, a diversion tunnel, and a powerhouse containing two 25,000-kw. generators. The powerhouse would depend upon release of water from the Link River Dam at the outlet of upper Klamath Lake. The company may not commence construction, however, until it reaches an agreement with the Department of Interior for the continued utilization, after 1967, of water stored by the upstream dam.

In addition to the opposition of th Department of Interior, severa groups of farmers in the Tule Lak area of California have expresse their objections to the project. The fear that licensing of a new powe project on the Klamath River wi limit further reclamation activitie and thus stunt the growth of the pres ent communities in the area.

$6,000,000 Alaska housing completed

THE LARGEST and most complet military housing structure ever erec ted by the Corps of Engineers, th new $6,000,000 composite bachelo quarters building at Whittier, Alaska has been turned over to port authori ties.

The 5-story structure, which is 52 ft. long and 160 ft. wide, contains suc facilities as a 2-story, 350-seat theater a bowling alley; a radio station; library; hobby shop; day rooms clubs; a bank; barber, beauty, an cleaning shop; commissary store post exchange; post office; gues room; a public cafeteria and sod fountain; a small hospital complet with operating room; X-ray clinic pharmacy; private rooms; a ward a cafeteria seating 540; offices; stock ade; classrooms, and rifle ranges.

John W. Maloney designed th building, which was constructed b Haddock Engineers, Ltd., and As sociates.

Oregon highway opened

A NEW 5-mile-long section of U. S Highway 101 between North Ben and Hauser, Ore., was scheduled t be opened to traffic.

L. A. transit studied

THE ENGINEERING FIRM o Coverdale & Colpitts has been re tained by the Los Angeles Metropo itan Transit Authority to determin the feasibility of using monorail i unplugging the city's jammed-u public transportation system. Fee fo the eight-month engineering and eco nomic survey is $85,000.

STEPS in the use of high-strength bolts are pictured here from left on construction of the new Schlitz Brewery. First, proper air pressure-tension ratio is determined on test stand. Next, final adjustments are made on regulator valve at compressor for air lines to impact wrench. Then bolt-up crews are ready to go to work with their impact wrenches for installing the bolts.

NEW BOOKS

URVEYING THEORY AND PRAC-ICE (New 4th ed.)—Davis and Foote

The fourth edition of this compre-ensive surveying textbook should be f interest to practicing engineers and urveyors, as well as to students. Em-hasizing the "how" as well as the why" of surveying, the book is di-ided essentially into three parts, cov-ring fundamental relationships and echniques, operations common to all ranches of surveying such as meas-ring and plotting angles and dis-ances, and the practice of surveying as extended to entire surveys. Having been critically reviewed in detail, re-visions have extended to the rewrit-ng of many sections with an eye to greater clarity, simplicity and intel-ligibility. New advances since the book's last edition 13 years ago are of course given consideration, including a discussion of applications of photo-grammetry in route surveying. 132 pages of tables are included. Pub-lished by McGraw-Hill Book Co., Inc., New York. 995 pages, 6 x 8¼. Priced at $8.00.

* * *

STRUCTURAL SHOP DRAFTING, Vol. 2—American Institute of Steel Construction

This is the second in a series of textbooks on the study of structural shop drafting. Supplementing the in-struction given in Volume 1, which was concerned with practices involv-ing riveted construction, the first two chapters of this new text cover the detailing of welded beam and column work. Then the balance of the volume treats drafting room procedures, the theory of statics and the preparation of shop drawings for other type struc-tures, essentially mill buildings. Most of the examples given are in terms of riveted or bolted construction, but the fundamentals involved are largely applicable to welded fabrication as well. Also to be presented for later study are the subjects of plate girders, highway and railroad bridges. Pub-lished by American Institute of Steel Construction, New York, 145 pages plus a 35-page appendix, 8¾ x 11¼. Priced at $3.00.

* * *

POWER PLANT ENGINEERING (3rd ed.)—Morse

A thorough study of stationary power and heating plants, including public service, industrial, and insti-tutional varieties, is the subject of this book. So complete has been the au-thor's revision of the parent "Power Plant Engineering and Design" that it must be considered more as a new book than a revision. Needs of stu-dents, consulting engineers, and plant operators have been considered. Fun-damentals are emphasized, leaving details and dimensions of equipment for more specialized books and manu-facturers' literature. The power plant is considered as an integrated assem-bly. Economic factors are pointed out, but specific costs and prices are avoid-ed as being subject to rapid change. Published by D. Van Nostrand Co., Inc., New York. 677 pages, 6¼ x 9¼. Priced at $8.75.

* * *

FUNDAMENTALS OF STRUC-TURAL ANALYSIS—Jakkula and Stephenson

Designed primarily to fit the needs of the beginning engineering student, this book is also intended to help the practicing engineer who finds it de-sirable, from time to time, to review one or more of the basic elements, fundamental principles, or elementary procedures involved in the stress analysis of statically determinate en-gineering structures. Its scope has been made sufficiently broad to in-clude all the basic principles and pro-cedures of structural analysis needed for the beginning engineering stu-dent, irrespective of the branch of en-gineering in which he is specializing. Published by D. Van Nostrand Co., Inc., New York. 284 pages, 6¼ x 9¼. Priced at $4.50.

NEWS OF DISTRIBUTORS

PAUL FIORITO (at controls), a partner in the construction firm of N. Fiorito Co., tries out a Marion shovel under the direction of (from left) *William Lanius*, Marion's Northwest representative, *David E. Rizor*, assistant to Marion's president, and *Jack Hatten*, secretary of Star Machinery Co., which sponsored the exposition.

Star Machinery Co. opens new plant at Seattle

Seventy manufacturers from the East attended the opening of Star Machinery Company's new plant at 241 Lander Street, Seattle, Wash. A machinery exposition and a symposium on the Pacific Coast market, presented by the University of Washington, were special features of the grand opening.

The plant's new machinery display center, which is 160 ft. long by 120 ft. wide, was filled with cutaway models, power demonstrations, and other machinery operation. This was part of the exposition's display of latest developments in machinery, power tools, and other industrial equipment brought from all over the country. The new building, which cost $800,000, occupies a site ground area of 106,000 sq. ft.

Facilities of the new building include the large machinery display center, a row of offices, a modern cafeteria, a large parts storage area, and enough railroad carloading and unloading facilities to handle six cars at a time.

Waco names two to sales staff

Robert H. Brown and Edwin Daw have been appointed to the sales staff of Waco Manufacturing Co., national manufacturers of steel scaffolding equipment and shoring. Brown will be in charge of national advertising and promotion. Daw will act as field representative and assist distributors in sales, customer relations, and engineering problems in regard to shoring applications.

Euclid names distributor

Western Tractor & Equipment Co. of Seattle has been named distributor for Euclid earthmoving equipment in western Washington and Alaska. Western, which is headed by Harry B. Fay, Sr., has branches in Chehalis, Tacoma, Anchorage, and Fairbanks.

Garlinghouse adds Clayton line

The line of Clayton steam generators, steam cleaners, and hot water heaters has been added to the construction equipment distribution firm of Garlinghouse Bros. in Los Angeles for the Southern California territory. The steam generator is use extensively in the construction fie in the production of concrete an asphalt products, in powering pi drivers, and in other applicatio where a compact, fully-automat source of hot, dry steam is require

Cat to open parts depot

Caterpillar Tractor Co. plans t open a new parts depot in Denve Colo., about February 1, 1954, accor ing to John Gilbert, parts depot ma ager. It is intended to improve par service for approximately 14 Cate pillar dealers in Colorado, New Me ico, Wyoming, Utah, and Montana

Sales rep. for Carboloy

Richard J. Benefiel has been nam district sales representative for t Carboloy department of General Ele tric Co. He will cover northern Ca fornia, Oregon and Washington fro his headquarters in Oakland, Calif.

Sika opens branch at Salt Lake

The Sika Chemical Corp., man facturers of Plastiment concrete de sifier and other products for new co crete construction and maintenanc has opened a branch sales office Salt Lake City under the manageme of H. C. Jessen, a licensed profe sional engineer and surveyor.

Wallace Mason retires

Wallace Mason, district manag for northern California and Neva for Armco Drainage & Metal Pro ucts, Inc., has retired from his co nection with the company and h opened an office as consulting en neer in the field of drainage and ir gation at Sacramento, Calif.

New equipment company formed in Southern California

Wallace Warnock and Willi Bancroft have announced the form tion of Warnock-Bancroft Equ ment Co. at 9635 Rush St., El Mon Calif. The office, parts warehou and shop cover more than 3,800 sq. More than 26,000 sq. ft. of fenced ya and open storage is available. Rob Howard is office manager, and Juli McMillon is parts manager. Li carried include such Gar Wo products as the Buckeye ditche spreaders, road wideners, finegrad and Model 75 shovel and truck cra Also handled are Joy Manufactur Co., drills and accessories, such

New home of new equipment company.

mpressors, paving breakers, tamps and spaders.

yster announces changes

Martin Larson, Spokane branch anager for Hyster Co. since 1951, as been appointed manager of the eattle branch in place of Fred Welch,

Larson

Robinson

who recently was made general manger of the San Francisco office. Fred D. Robinson, formerly with A. H. Cox Co., will be the new manager of the Spokane branch.

Chain Belt appoints Western mgr.

Robert G. Kuhnmuench, Eastern district manager of Chain Belt Co. since 1952, has been appointed Western district manager with office at 3838 Santa Fe Ave., Los Angeles.

Kuhnmuench for Chain Belt

Gieszl for Peterson

Peterson names rep.

Ray F. Gieszl has been appointed special service representative for Peterson Tractor & Equipment Co. of San Leandro, Calif., Bay Area distributor for Caterpillar and John Deere products. He will work with Peterson customers on special service problems and in conducting service training programs for contractors.

Hensley names distributor

Hensley Equipment Co., manufacturers of heavy-duty dozers and brush rakes, scrapers, rippers, dozer end bits, track rollers and allied tractor attachments, has appointed Western Tractor & Equipment Co. as distributor for the complete Hensley line.

U. S. Rubber names Western regional manager

Dugald McKinnon has been appointed Western regional manager of the U. S. tires division, United States Rubber Co. His offices will be in Denver. Joseph Bernat has been appointed sales manager to assist him.

Link-Belt appoints rep.

Maynard Hoye has been appointed district representative for the Link-Belt Speeder Corp., manufacturer of power cranes, shovels and draglines. Hoye's district will include Colorado and New Mexico.

Copco builds in Phoenix

Copco Pacific Ltd., rock drilling equipment distributors, has finished building its new Southwest sales office and warehouse at 1326 N. 22nd Ave., Phoenix, Ariz. The firm, which has its headquarters at San Carlos, Calif., is the sole Western source for Atlas rock drills and Coromant drill steels.

Walter P. Jones dies

Walter P. Jones, 61, died in Spokane, Wash., on October 31 after a short illness. He was district representative for the Caterpillar Tractor Co. with headquarters at Spokane since 1946.

Galion promotes Borror

James M. Borror, formerly Northwest district representative for Galion Iron Works and Manufacturing Co., has been promoted Western sales manager. His new territory will include the states of Montana, Wyoming, Colorado, New Mexico, Arizona, Utah, Nevada, Idaho, Washington, Oregon and California.

NEWS OF MANUFACTURERS

Allis-Chalmers takes over Buda Co.

The Allis-Chalmers Manufacturing Co. assumed operation of the Buda Co. in November. According to W. A. Roberts, president of Allis-Chalmers, Buda will continue to manufacture, distribute, and service all items in its regular line of products as a division of Allis-Chalmers, under the direction of Ralph K. Mangan, president of Buda since 1950.

Bechtel sells Somastic Division

Pipe Linings, Inc., Los Angeles, a subsidiary of the American Pipe & Construction Co., has purchased the Somastic Division of Bechtel Corp. of San Francisco. The transfer includes all patent rights and licenses to the Somastic pipe coating process for the exterior treatment of steel pipe as protection against corrosion, the manufacturing plants currently in operation, and all personnel of the Somastic Division. J. S. Connell, general manager of the Somastic Division, will remain in an advisory capacity for a period of time. Austin S. Joy, Somastic's general sales manager, will become sales manager of Pipe Linings.

Roebling names sales mgr.

Forest S. Burtch, wire rope sales manager for John A. Roebling's Sons Corp., has been appointed product sales manager of the newly-formed construction materials department. Elmer A. Trask will succeed Burtch

Trask

Burtch

as wire rope sales manager. The new department was created to make available, through a single source, the complete Roebling line of wire and stranded steel products for prestressing concrete.

Case holds industrial field day

J. I. Case Co. industrial dealers from all over the country attended a field day at an airport near Racine, Wisconsin, to watch Case industrial tractors in action. Products displayed included the Henry Manufacturing Co., backhoe; Meili-Blumberg Corp., M-B Maintainer and a tractor-mounted sweeper; Sherman Products, Inc., backhoes; Shawnee Manufacturing Co., Hydro-Clam; and the Wagner Iron Works, front-end swing loader and front-end swing digger.

Other machinery on display was the Be-Ge Manufacturing Co., Speedhaul Scraper; a hydraulic mower by A. C. Anderson, Inc.; and a snow blower developed by Wm. Bros Boiler & Mfg. Co. Still other machinery shown were Arps half-tracks, Baker-Lull Shoveloaders, a snow plow and dozer displayed by Anderson Engineering Co., and cabs for industrial tractors displayed by Allen Industrial Products, Inc. Every machine displayed was either attached to or powered by a Case industrial tractor.

Blaw-Knox acquires All-Purpose Spreader Co.

Blaw-Knox Co. has completed a preliminary agreement to acquire all outstanding stock of All-Purpose Spreader Co. to complement Blaw-Knox activities and to fill out its present line of road paving equipment.

Link-Belt names sales mgr.

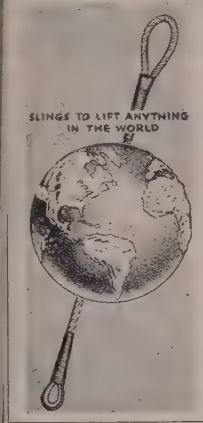
Gordon W. Rowand, district representative for Link-Belt Speeder Corp. in the Pacific Northwest, has been appointed assistant sales manager of the corporation with headquarters at Cedar Rapids, Iowa.

Continued on page 130

space is sold as advertisers' inches. All advertisements in this section are ⅛ in. short of contracted space to allow for borders and composition.

CLASSIFIED SECTION

Rates are $8.50 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 23rd if no proofs are required.



SUPPLIERS OF CONTRACTOR & LOGGING RIGGING

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Splicing and Socketing

- Custom Lifting Devices
- Arch Lines
- Chokers
- All Styles Wire Rope Slings
- Lowery's Safety Cartow

BEacon 8383

LOWERY BROTHERS
WIRE ROPE SPLICING SERVICE
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Talk it over with us. We are specialists in construction machinery and industrial plant appraisal, inventory reduction and liquidation.

Let our legal and tax division serve you.

Write or Wire Today

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AUCTIONEERS
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595 - 5th Avenue, New York City
450 Sutter St., San Francisco

HELP WANTED

GOT THE MAKINGS OF AN EDITOR?

- Here's a beginning job on a construction engineering magazine with a good future for a man in his twenties who is willing to learn.
- Some engineering training or construction experience desirable. Ability or background in journalism helpful.
- The job includes travel with expenses paid. Headquarters on Pacific Coast. Salary open.

Write Box 1201

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609 MISSION STREET
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Learn latest methods to organize and run work. Prepare for the top jobs. Send post card for details.
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CAPACITY 3 TO 20 TONS
SELL, RENT OR BUY

FOR DAMS, BRIDGES, BREAKWATERS, FILTRATION AND SEWERAGE PLANTS

FOR SPEED, ECONOMY, EFFICIENCY, FLOOD SAFETY, LABOR REDUCTION

AMBURSEN DAM CO INC
295 MADISON AVE NEW YORK

ENGINEERS

Structural, mechanical, and electrical for work on hydro-electric power developments. Write giving full experience record and qualifications.

HARZA ENGINEERING COMPANY
400 West Madison Street
Chicago, Illinois

Let WESTERN CONSTRUCTION Help Sell Your Surplus Equipment!

Have you any used or rebuilt equipment for sale or rent? WESTERN CONSTRUCTION offers you many potential outlets, at a good profit and little expense to you.

Announcement of your surplus equipment in the classified columns of WESTERN CONSTRUCTION puts your ad in the greatest concentrated market in the eleven Western states.

Men who read the classified columns do so with an eye to buying.

★

TURN YOUR SURPLUS MACHINERY INTO CASH!

★

Use the Classified Columns of WESTERN CONSTRUCTION regularly.

WESTERN CONSTRUCTION
Classified Adv. Dept.
609 Mission Street
San Francisco 5, California

I'm interested. Here's an ad according to rates at top of page.

FIRM.....

CITY.....STATE.....

SIGNED.....

Set 1, 2, 3 Columns, (specify which) by ..... inches (1-10).

BUSINESS OPPORTUNITIES

Want Ad Order Blank

Please run my ad 12, 6, 1 time (circle which) according to rates at top of page 144. Make ad 1, 2, 3 columns wide (circle which) by ..... inches (specify, one to 10) deep.

Signed .....

Address .....

City ..... State .....

WRITE AD HERE:

.....

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Send ad to Classified Dept.,
WESTERN CONSTRUCTION, 609 Mission St., San Francisco 5, Calif.

More NEWS of MANUFACTURERS

National Welding names sales mgr.

Henry L. Pohndorf, chief engineer of the National Welding Equipment Co., San Francisco, has been appointed sales manager in addition to his engineering duties.

American Pipe moves

American Pipe & Construction Co. has moved its district manufacturing facilities from Oakland to a new location on Alquire Road in the vicinity of Hayward, California.

Clark names marketing mgr.

Clarence E. Killebrew, formerly general sales manager for the Frank G. Hough Co., has been named manager for marketing and sales of the Construction Machinery Division of Clark Equipment Co., manufacturers of material-handling equipment. Among the products which will fall within his jurisdiction are those formerly manufactured by Michigan Power Shovel Co., which was acquired by Clark Equipment Co. in May.

INDEX TO ADVERTISERS IN THIS ISSUE

BACKFILL, uncompacted

"Tricks of the Trades"—Your new department

There's one general class of information in *Western Construction* that hasn't been given its proper dignity up to now. We have editorial "departments" for personnel, for manufacturers' releases, for bid information, and for job news. But we haven't clearly labeled some articles and short items and book notes that are of highest interest to you as individuals of the construction trades. Next month we start doing this.

"Tricks of the Trades" will be a new editorial feature in *Western Construction.* It'll be our "new and used" information section. That is, some of it will be tricks you have used on your jobs, and some of it will be tricks for you to use. If it's a trick of forming, or of machinery operation and maintenance, or of concrete handling and finishing, or a new way to tie re-bars —let us know! And, when we hear something worthwhile from a resident engineer or a manufacturer or a distributor, we'll pass it on to you.

"Tricks of the Trades" gives us as editors a better chance to mark material for your special attention. We'll include a selection of items on new equipment and manufacturers' literature that are of most value to the construction trades man himself. And if there's a new book out for diesel mechanics, you'll know it from "Tricks of the Trades."

This will be your special department, so if there is some type of information you think belongs in "Tricks of the Trades" which doesn't appear there, write in and let us know, and we'll do our best to give you what you want. On the other hand, if we print information in this department which you don't think belongs there, let us know about that too.

Can you read Arabic?

One of the engineers back from work for M-K in the Near East tells this one. It's a standard gag that was pulled sooner or later on every new man assigned to survey work. On at least one occasion the gag man was 'way down in the hole on a dusty, rocky dam site when he saw one of the surveyors leave his instrument 'way up on the abutment and start running, slipping and sliding down into the canyon. Pretty soon the surveyor got to the bottom and came dashing across the rocks, leaving his own cloud of dust behind him. Breathlessly he stopped short before the story-telling engineer:

"Gotta have some log tables! Seem to have lost mine. Do you have a book of tables with you?"

The humorous character casually went on with his own work, remarking offhandedly, "Yeah, but can you use them? They're all in Arabic!"

On this occasion, as on all the others, the greenhorn surveyor was half way back up the abutment before his own mind got up out of the dust, and he made his way down again to borrow the log tables.

Hats off to Earl Bunt

We questionnaired one subscriber a while back and were sorry to learn from his reply that he is no longer in the construction field. But, he went on to recall for us a long career in the business:

"For many long years I worked as a truck driver, bulldozer and Cat and can man. I have done nearly every type of work done by machine in the dirt moving field—even in the early days of the Slate scraper. But with age creeping up on me I could no longer stand the bouncing of the Cats or move fast enough on dump trucks I had to turn to line driving."

And he seems to be doing well. His name is Earl Bunt, and he was named Northern California Truck Driver of the Month earlier this year. The Teamsters, the National Safety Council, and the Truck Owners Association of California are behind this award, and we're glad to see a construction man win it.

Cementing public relations

Letting the public—nearly 400,000 of them—into the act, the Calaveras Cement Co. operated a 1:96 scale model of its San Andreas cement plant at the California State Fair a couple of months ago. Covering an area 8 x 10 ft., the model included a complete machinery layout, with major items actually in motion, powered by eight electric motors. The faithful model builders even duplicated actual operating speeds.

For authenticity and to assist visitors in understanding the 4-kiln plant's functions, Calaveras made extensive use of clear plastic where there is "something to see inside," and they introduced samples of the real material at various points in the production line — even grinding these down to proper scale! A final touch was a continuously playing record that anticipated questions before they could be asked.

Calaveras says its booth, featuring this exhibit, won first prize in the judging of its classification. We concur in the judgment, and tip our hat to Calaveras for this means of "cementing" its public relations!

Twenty-five years ago in *Western Construction*

"A machinery manufacturing consolidation of major importance which brings together under the name of **The National Equipment Company** the business of the Koehring Company, the T. L. Smith Company, the Insley Manufacturing Company, and the Parsons Company, has been announced."

* * *

"In the 1929-30 budget recently submitted to Congress by President Calvin Coolidge, there is an item of $8,639,000 for the Bureau of Reclamation projects, which is $4,190,000 less than this year's appropriation."

* * *

"... the Far West has won its fight for the construction by the United States Government of the great dam on the **Colorado River.** The tactics employed by the so-called power trust finally proved a boomerang, and the bill appropriating $165,000,000 for its construction was passed by both houses of Congress and signed by President Coolidge with almost unprecedented rapidity ... The greatest construction era in the world's history —centered in the Far West— certainly looms as a reality."

* * *

"Self-dumping material skips were an important feature in speeding up construction on the Montgomery Ward building, the latest large addition to Denver's skyline. It contains 26,600 cu. yd. of concrete, 1,600 tons of reinforcing steel, and will cost about $1,360,000."

* * *

"**James G. Tripp,** who, as construction superintendent for Atkinson, Kier Bros., Spicer Co., completed the Coolidge dam on November 10, is now general construction engineer for the Atkinson Construction Co. on the Pardee dam; **E. M. Whipple** continuing as construction superintendent."

By THE EDITORS