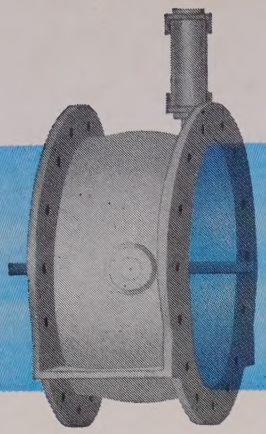
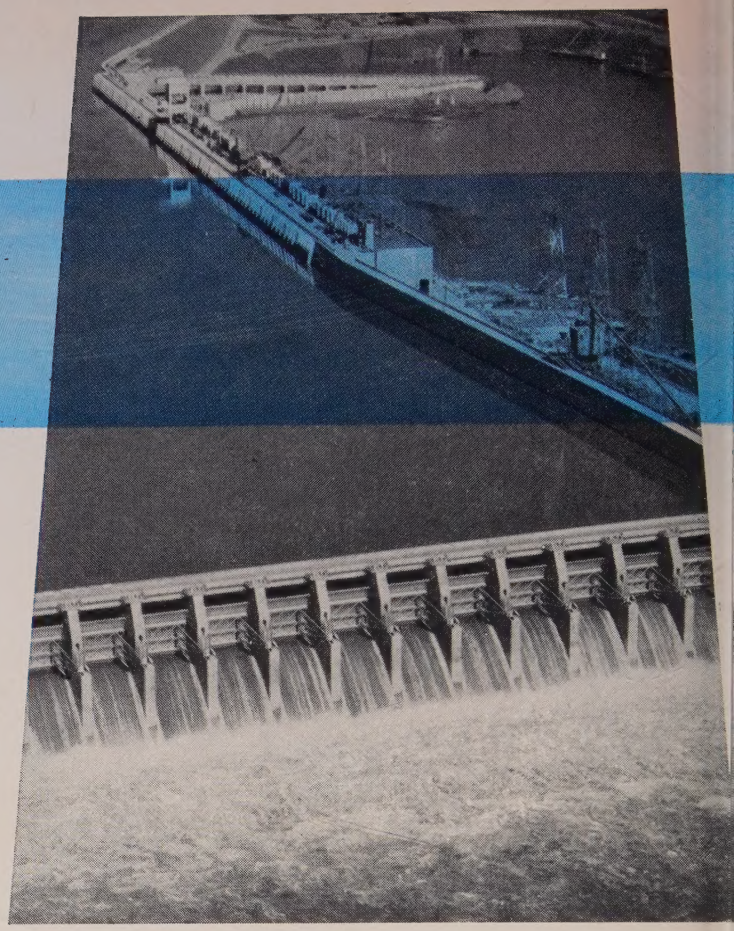
ESTERN
ONSTRUCTION

NEWS on guard in Alaska . . . p. 27

NOVEMBER 1960





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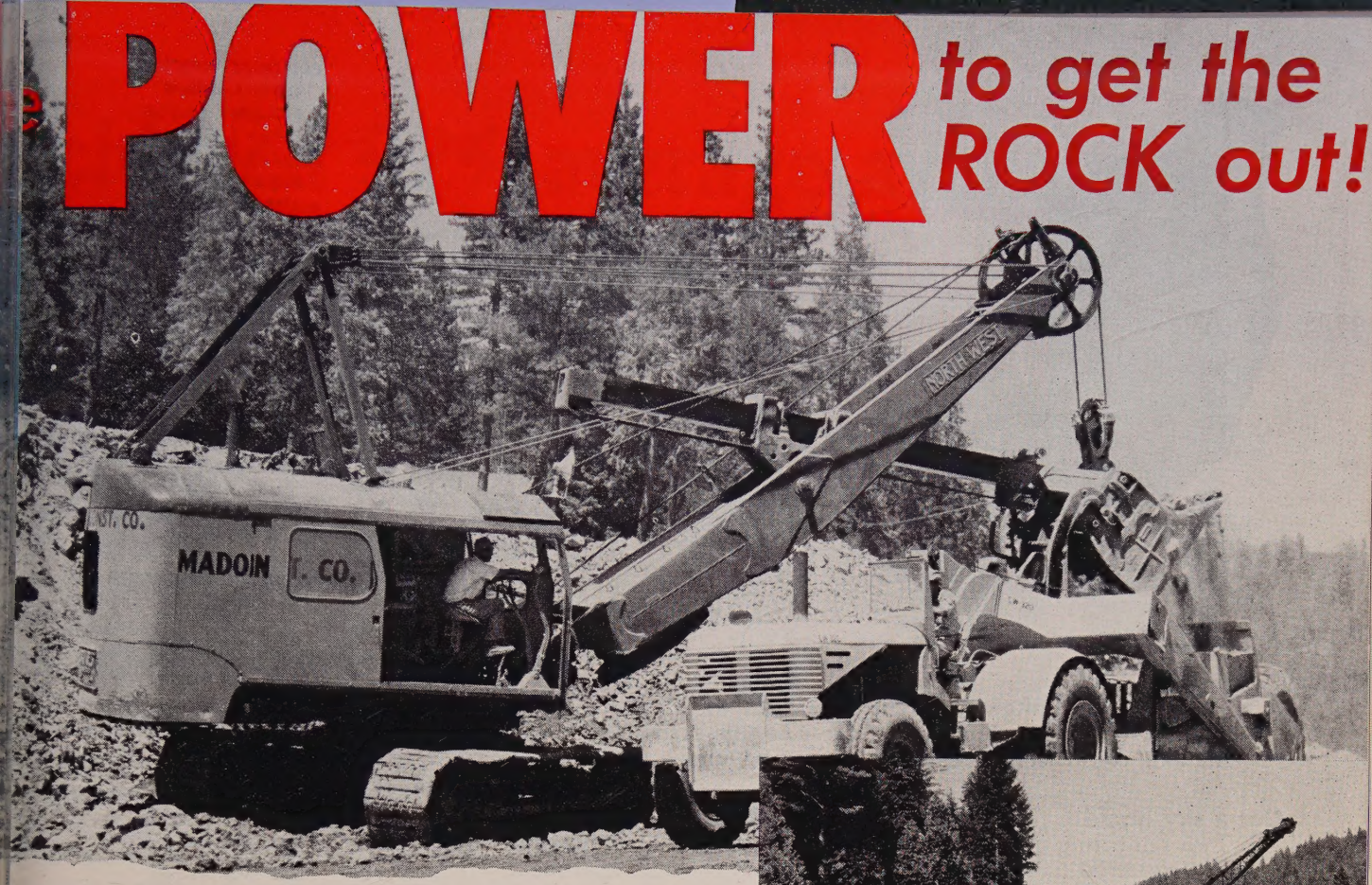

a rough rock job, one of the many rock cuts on Route 40 n Baxter and Monte Vista, California. The contractor is the na Construction Company of San Luis Obispo, California and chine is one of two new Northwest 80-D's on the job. They Northwests that the Madonna organization has bought—five orders that attest to the high performance Northwests have ed on Madonna jobs.

our Northwest is a *real* Rock Shovel. Booms are rugged and ul. Sticks are heavy in section. The Northwest Dual Independent gives you crowding force most independent crowd shovels It handles harder digging and more yards per hour—per day month! The Feather-Touch Clutch Control makes operation nd combines with the Northwest Crowd to give smoother verability of the dipper when probing out a ledge of rock or g a big one into the truck.

ne Cushion Clutch eliminates shock overloads before they can operating machinery and cast alloy steel machinery bases and ery side frames take the twisting, wracking strain of digging minate periodic rebuilding.

hese are just a few of the things that get the job done—the that let you say, "That Northwest is always ready to go." They ong the advantages that make the Northwest the finest machine ind. They make one out of every three Northwests sold a repeat vith successful contractors like Madonna Construction Company.

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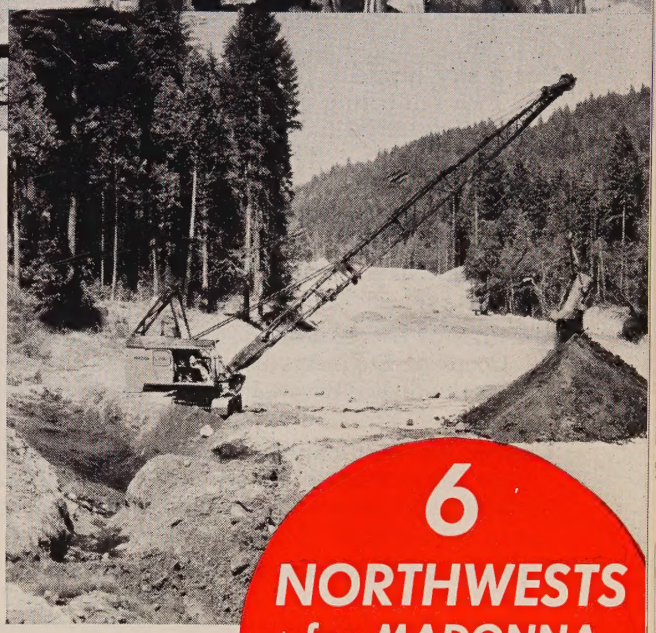

A new Northwest 80-D works as a Dragline on Route 40. A Model 41 is working in the background.

6 NORTHWESTS for MADONNA CONSTRUCTION COMPANY San Luis Obispo Calif.

S-80-16-SC

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WESTERN CONSTRUCTION

NOVEMBER
1960
Vol. 35 No. 11

CONTENTS

COVER—Backstays for the 400-ft. length of radar reflectors help support the 1,500 tons of steel against arctic blasts. A powerhouse with a 22,500-kw. output is required to provide the surge of power for this warning system. The contractor's construction story starts on page 27.

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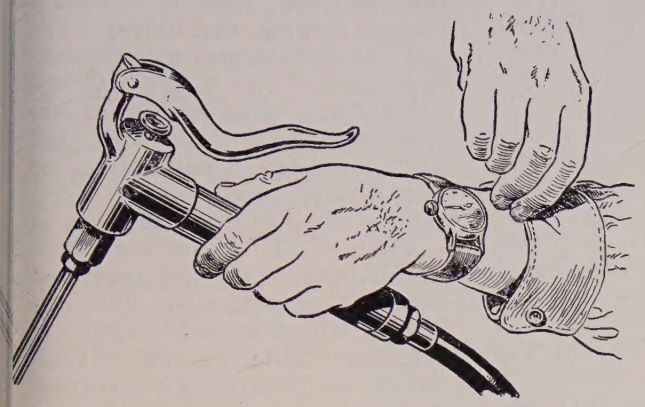
For 34 years serving the construction industry of the Western States

achieved 92% average availability



Clockwork lube scheduling boosts availability

Every machine on Maco's spread is serviced every day, in the period between the close of the day shift, at 4:30, and the beginning of the night shift, at 7:30. The 22 scrapers are lined up in a double row, and the mobile rig passes between them. Every machine is lubricated completely, and air filters are cleaned, at the end of every 10-hour shift. Crankcases are drained every 100 hours. Lube interval on gearboxes and torque converters is 2000 hours.

Simplified Lubrication Plan protects 33 major units with only five products

TEXACO SIMPLIFIED LUBRICATION PLAN		
1	Ursa Oil Heavy Duty:	engine crankcases
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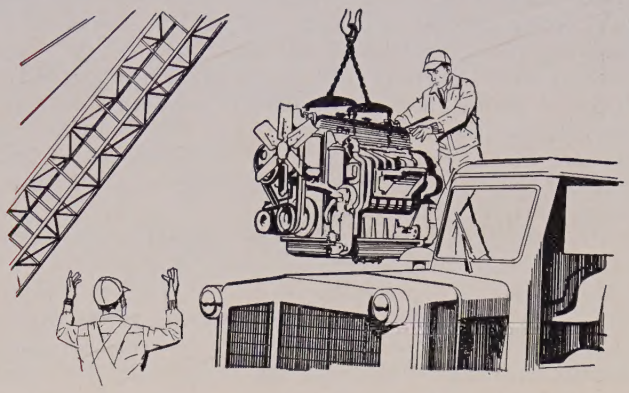
3	Universal Gear Lubricant EP:	all gear boxes and final drives
4	Crater 2X Fluid:	open gears and wire rope
5	Marfak Multipurpose:	chassis and track rolls

With their Texaco Simplified Lubrication Plan, Maco gets fast, thorough, systematic lubrication for all major equipment with the smallest possible lube inventory. This inventory simplifies and speeds up application routine because it avoids confusion, minimizes downtime due to misapplication of lubricants, and lets Maco put their lube inventory on the mobile rig for complete on-the-spot coverage.



Replace-don't-repair theory cuts shop time

Although Maco is well equipped to handle emergency repair on the job, they cut shoptime drastically by sticking to an exchange system on major components like engines, transmissions and torque converters. Duplicate spares of these units are kept on hand. Then the defective unit is simply removed intact from the machine and replaced with a new or rebuilt one. All major repairs on engines, transmissions and torque converters are done at the Rawlins shops. Parts are flown in via Maco's own plane from headquarters in Rawlins, Wyoming.

Minimum downtime on equipment is the principal advantage of the exchange system, but not the only one. For instance, engine repairs can all be made in a fully equipped shop, without having to rush or make temporary repairs; and this system also ensures full availability of the field maintenance crew for their routine work.

Texaco Lubrication Engineers

There are 2,300 Texaco Distributing Plants in the U. S. ready at any time to help you develop a Texaco Simplified Lubrication Plan for your next job. Since every Texaco Plan is designed to lubricate specific equipment on a specific job, you'll get the best results by consulting a Texaco Lubrication Engineer. Texaco Inc., 135 East 42nd Street, New York 17, N. Y.

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The WEST from WASHINGTON

By E. E. HALMOS, JR., Washington, D. C.

The vast construction potential that's involved in anything approaching full recreational use of Western water projects will be a subject of prime interest for Congress early in the next session, regardless of the outcome of the elections.

How much construction and how much money might be involved — if you include the Corps of Engineers' projects along with Bureau of Reclamation — is anybody's guess. But it could certainly mount into the hundreds of millions of dollars. On the Colorado River Storage Project alone, Congress has already approved a total of $17 million for recreational construction work — and that's not nearly all that could be spent on this single group of works.

A more detailed picture of what may be done, and how much it may cost, will be available sometime after January. You may recall that the House Public Works Committee ordered BuRec and the Corps to bring in complete reports on recreational facilities planned, "in time for consideration during the hearings on 1962 appropriations . . ." That means, of course, early in 1961.

The two agencies are also directed to report on how the leasing of land and concessions will be handled, and make recommendations for specific guidelines for transferring the management of reservoir areas to states and other local interests.

The question of recreational use of Western water facilities kept cropping up throughout committee hearings at this year's session of Congress—much of it centered on the facts of increasing use, lack of federal funds to build such facilities, and means of reimbursing the federal government for expenditures it does or may make for this purpose.

The fact is that construction of recreational facilities, under present law, must be charged to water users—who haven't been eager to pay for them. To get around this point, and meet growing demand from the public, BuRec has been using a loophole in existing laws to build at least minimal facilities. It has constructed such facilities, from its own funds, where it felt construction could be justified on the ground of "protecting health and safety," or of protecting federal property from damage.

There was a provision in the 1960 omnibus appropriation bill as passed by the House that would have permitted BuRec to assign costs of constructing recreational facilities to "unreimbursible costs" of a project. A House-Senate conference committee knocked out this provision before the bill was passed, in favor of the House suggestion that BuRec and the Corps bring in a full report on the subject, next time around.

* * *

Meanwhile, the Bureau of Reclamation, with its funds set for the 1960-61 construction season, moved to get work started on four new projects, and made favorable recommendations on two more.

The four new jobs are: Curecanti Unit of the Colorado River Project; Florida Participating Project of the same over-all job; Yellowtail Unit of the Missouri River Basin Project and Almena Unit of the Missouri job. BuRec announced opening of field offices, as a first step toward getting construction started: for Curecanti, at Saperino, Colo.; for Florida, at the existing Durango office; for Yellowtail, near the dam site, upstream from Hardin, Mont.; and for Almena, at Norton, Kans.

The new projects okayed by Bureau engineers (for later Congressional approval) were the proposed Columbus Bend project on the lower Colorado, in Texas (near the city of Columbus); and the Crater-Long Lakes Division of the Snettisham project, near Juneau, Alaska.

Columbus would be a $21.7 million project, when fully developed, and would create a reservoir with an initial capacity of 235,000 ac.-ft. Principal objectives would be to increase available supply for municipal and industrial water and power in an area served by the Lower Colorado River Authority.

The Snettisham Project is planned as a single-purpose hydropower development, to serve foreseeable needs of the Juneau area. It would include a three-unit powerplant, with an installed capacity of 48,000 kw., located near the mouth of the Speel River, 28 mi. southeast of Juneau. It would cost an estimated $38.4 million to build.

* * *

Hammering away at its long-held contention that hiring halls and union clearances for construction workers are illegal, the National Labor Relations Board has ordered Western union locals (and their employers) to cease giving effect to such agreements.

One of the cases involves a Southern California contractor and a chapter of the Associated General Contractors; the other two involve Wyoming contractors.

In the California case, NLRB ordered the Peterson Construction Corp., the Southern California Chapter of AGC, and Local 220 of the Hod Carriers (and other union locals) to cease abiding by any agreements with the employer and the association which "unlawfully conditions hire or retention upon referral or clearance by the unions; causing or attempting to cause (by the unions) the Association or its members to discriminate against applicants; or in any other manner restraining or coercing applicants in their rights to refrain from union activity." At the same time, AGC was ordered to "cease encouraging" union membership by following the alleged agreements; and Peterson was ordered to offer two non-union men (who brought the charges) "immediate employment" at Edwards Air Force Base operations.

The cases in Wyoming involved the Operative Plasterers' and Cement Mason's International Assn., Local 299, of Cheyenne, ordered to cease trying to force the Laramie Construction Co. to refuse to do business with Read Ready Mix Co. by pressure on employees of six contractors. Interestingly, NLRB found that part of the union's intent was to try to force the Corps of Engineers and the Air Force to cease doing business with the six contractors (Blount Bros., Laramie; Wallace Process Piping Co., Catalytic Construction Co., Sheet Metal Products Co. and C. Cartwright Plumbing & Heating, Inc.)

Second Wyoming matter concerns Local 494 of the International Association of Bridge Workers, which was ordered to stop trying to force Spiegelberg Lumber & Building Co. of Laramie to discriminate against its employees who are opposed to bargaining

(Continued on page 16)

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done for them by the union. An employee allegedly discharged for such activity was ordered to be paid for time lost by reason of discrimination.

* * *

The U. S. Supreme Court opened its fall term early in October, with no major cases involving Western construction activities on its docket, but with a series of cases that will have major effect on the industry in general.

One of these was on a question similar to those ruled upon by NLRB on the use of hiring halls and union clearances. The case has been filed by NLRB and names three joint-venturers (Morrison-Knudsen, Walsh Construction Co., and Perini-Quebec, and various subsidiaries), who were engaged in building parts of the now-completed St. Lawrence Seaway. NLRB had found in a decision that the three employers violated labor acts by utilizing a hiring hall and giving preference to union employees (operating engineers), ordered that the companies refund to their employees all union dues and fees which were withheld from paychecks.

Lower courts, however, held that such refunding would be "inappropriate and arbitrary," said reimbursement needn't be made. They upheld, however, NLRB's finding that use of the hiring halls was illegal.

Two other cases before the High Court involve the right of a state to tax an out-of-state corporation for work done away from its home base. In one, the State of Alabama wants to collect taxes from a New York-based dredging contractor (Standard Dredging Co.); in the other, the State of Michigan wants to collect taxes on Armco Steel Corp., which does business in Michigan, though its home base is in Ohio. Point at issue here is the company's contention that Michigan wants to tax the company's total gross receipts, even though much of this does not originate in Michigan.

* * *

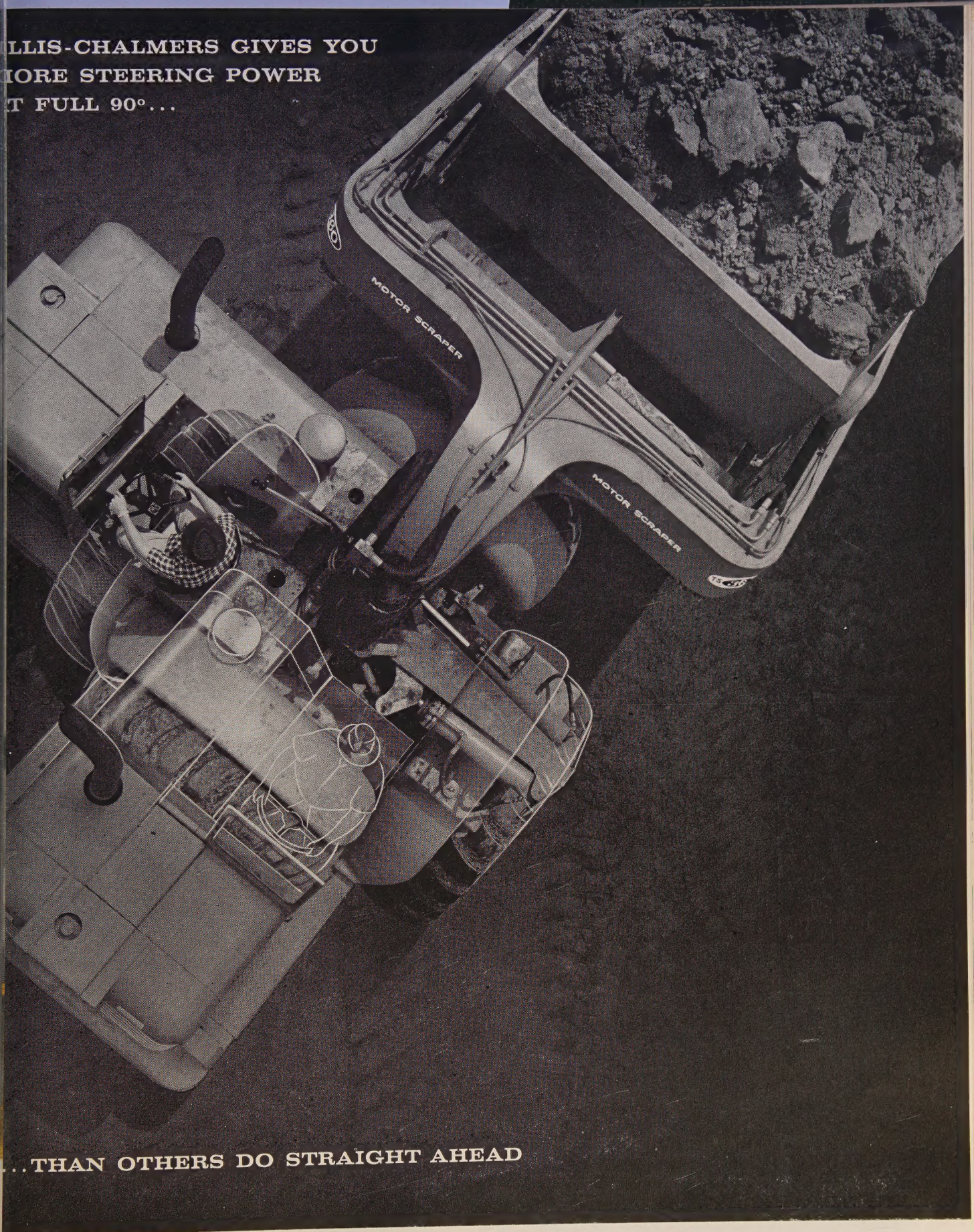
On court matters, there's vast interest for engineers, construction men and city officials wrapped up in the suit that the Department of Justic filed (on behalf of the Department of Health, Education & Welfare) against the City of St. Joseph, Mo.

This is the first case of its kind ever filed under provisions of the Federal Water Pollution Control Act. It seeks to enjoin the city from continuing to pollute the Missouri River by discharging untreated sewage into the stream. The action follows refusal of city voters to approve a bond issue for construction of a treatment plant ordered by HEW after a series of hearings and other legal processes.

What makes it especially interesting, according to Washington attorneys, is that the suit apparently includes the city's entire 78,000-odd residents, as well as city officials, in its prayer for injunction. Enforcing an injunction against 78,000 persons will be a very neat trick, legally speaking.

You may recall details: Kansas State Board of Health complained of the pollution; HEW held a series of conferences on the matter in 1957 and through 1959, then ordered the city to build abatement works and have them completed by June of 1963. City officials called a bond election, as ordered — and voters defeated the proposal.

If the courts uphold HEW's suit, the decision will put real teeth in future orders to municipalities for construction of treatment works.


LLIS-CHALMERS GIVES YOU
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MOTOR SCRAPER
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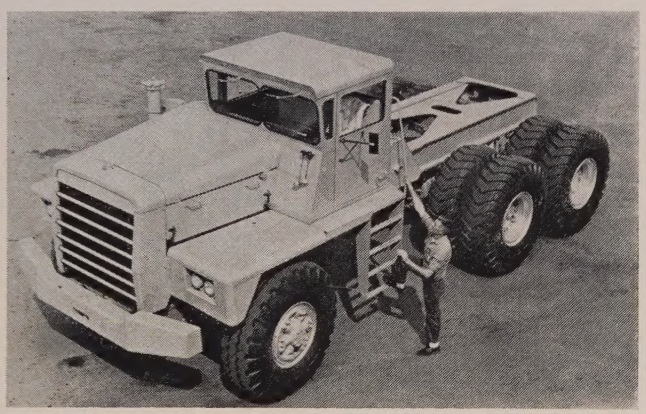
...THAN OTHERS DO STRAIGHT AHEAD

NEW EQUIPMENT

Obtain more information on these new developments in construction equipment by writing the corresponding numbers on reply postcard.

Mack announces a 45-ton rear-dump

Designed especially for heavy-duty hauling requirements, **Mack Trucks, Inc.,** is introducing a new 45-ton capacity rear dumper (M-45SX) which succeeds Mack's Model LYSW. The unit is powered by a 450-hp. diesel engine and has 4-wheel drive. This 6-wheel unit, with its 8-speed overgear transmission and air-assist clutch or optional torque converter drive, handles with ease and safety. Positive braking control regardless of load



is provided by front air brakes and rear air-hydraulic brakes. Each pair of brake cylinders is mounted inside the frame for major protection. A Mack 50-hp. power take-off is standard equipment. With a 119-in. tread, the machine has maximum stability and a short turning circle of 75 ft. . . . *Write No. 150*

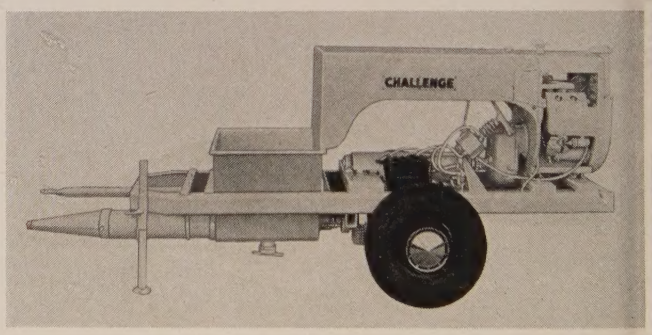
Truck crane with record boom length

Handling a boom length 40% longer than any other machine in its weight or price category, **Harnischfeger Corp.** has announced a new 20-ton capacity truck crane. The unit (P&H Model 255B-TC) will handle safely boom and jib extensions up to 140 ft., and the company notes that this reach could formerly be

achieved only through heavier and considerably more expensive 30-ton units. Lifting capacity is said to equal that of a 25-ton machine. Equipped with a 110-ft. boom and 30-ft. jib extension, the new P&H has demonstrated ability to deliver a 5,500-lb. load 12 stories above ground, or of positioning 4,300-lb. loads 60 ft. away. This ability is credited to a new concept of balancing which designers used in the choice and location of components. This design is credited with producing a 20-ton machine that has no difficulty in delivering performance equal to those rated at 25-ton capacity. The new unit can readily be equipped with a dragline bucket, clamshell bucket or pile driver, all using the standard 40-ft. boom. A backhoe attachment is available, and it can also be connected to a shovel rig. . . . *Write No. 151*

Challenge-Cook heavy-duty grout pump

Named the "Grout King," **Challenge-Cook Bros.** announces a rugged heavy-duty machine that will handle up to 20 cu. yd. of material per hour for all types of grouting service. The new machine adds to the line of construction equipment produced by this manufacturer. The pump is designed to handle a lift equal to a 10-story building and to pump material 300



ft. horizontally. The unit is powered with a 30-hp. air cooled engine equipped with self-starter and a 3-speed transmission. It also has a reverse gear to assist in clean-out work. The machine is trailer mounted and can be easily towed on the highway. . . . *Write No. 152*

Minneapolis-Moline introduces chain saw

A new full line of fast-cutting, direct-drive chain saws has been introduced by **Minneapolis-Moline.** Designed for all needs of contractors, the line is powered by two-cycle gasoline engines with ball and roller bearings for long and smooth operations. The saws have either magnesium or pressed steel frames, making them well balanced and easy to handle. The saws have automatic oilers or comfortable thumb-operated oilers at the pistol grip. Lengths are from 16 to 48 in.
. . . *Write No. 153*

(Turn to page 94 for more New Equipment)
(New Literature can be found on page 92)

WESTERN CONSTRUCTION

Are Contractors Up With the Parade?

WESTERN CONTRACTORS have the reputation of being progressive, ingenious and in step with new developments. In fact, they have been credited with stimulating many innovations in the field of construction equipment. National sales managers of construction equipment manufacturers say they like to deal with contractors in this Western region because they are alert to opportunities for securing maximum advantage from new machines and methods.

Not many years ago, this was a relatively simple procedure. Machinery and products used in construction were comparatively simple and evolved at a reasonable pace. A contractor could digest these changes at a corresponding speed.

Science and industry have changed this placid pattern. Design and introduction of new types of equipment, and new materials used in construction move forward at a terrifying pace. What might be considered strictly modern on today's construction job may be outdated next year. Although it is impossible for contractors to renew their machinery with improved models on a yearly basis, at least they should have thorough, up-to-date knowledge of these new tools. It will help them anticipate the trend in bid figures and costs.

Construction consists principally of three elements: (1) equipment, (2) methods and (3) materials. When these three are combined with maximum efficiency and under skillful management, the job results in a profit, and produces a satisfactory project for the engineer. These three elements, however, must be up-dated constantly. Developments can happen literally overnight to change the requirements in the engineer's design, or the bids of competitive contractors.

It is only necessary to review quickly the advertising and editorial pages in our last twelve issues to glimpse this speed in construction evolution. There is hardly an issue without an advertisement announcing some radically new machine that will carry out some operation better than it could be performed with existing equipment. Machines are not only different, but they may be bigger or faster.

Materials and governing specs develop at a similar pace. Engineers are demanding aggregate that must meet requirements unheard of ten years ago. Admixtures are performing new functions. Plastics and new metals are around the next corner. Methods advance with almost every job. Hardly an article describes work on a modern project without reviewing some new or improved way of carrying out a construction procedure. Combinations of all of these developments represent a staggering potential in advancing construction.

Advertising ideas and messages must be scanned closely. Salesmen from distributors and producers should be recognized as sources of valuable information on machinery to meet special job problems.

Open-mindedness is essential if the reputation of Western contracting is to be maintained. Contractors and all members of their supervisory staffs must be alert to keep in step with the fast moving construction parade.

Jim Ballard

WESTERN CONSTRUCTION was founded in January 1926 as *Western Construction News*. *Western Highway Builder*, founded in 1919, was consolidated with *Western Construction News* in April 1932 and subsequently became *Western Construction News and Highways Builder*, which title was later changed in April 1934 to *Western Construction News* and finally in July 1950 to *Western Construction*.

No lost time—No replacement parts with RPM Tractor Roller Lubricant!

Tractor equipment of Gibbons & Reed Construction Co., Salt Lake City, operates in extreme heat, cold, dust and moisture. Yet, despite severe working conditions, track rollers and bearings have given remarkable service using RPM Tractor Roller Lubricant.

"We've used 'RPM' for over 10 years," reports Master Mechanic Harold Higgins. "... it has done a fine job, and we've definitely saved on replacement parts. This lubricant seals out dust and moisture to keep bushings in good shape. We use RPM Tractor Roller Lubricant on over 60 pieces of heavy construction equipment."

Gibbons & Reed is one of Utah's top general contractors with construction jobs throughout Western states. Their maintenance policies are the result of over 25 years field experience. As Harold Higgins says: "You can't meet schedules when equipment is down ... that's why we rely on 'RPM' to help keep 'em rolling!"

RPM Tractor Roller Lubricant resist wear because it flows evenly to all bearing surfaces, lubricates and retards rust formation. Its special compounds create a tough, wear-resistant film that seals out moisture and dirt.

Why not try RPM Tractor Roller Lubricant? Chances are it can help reduce down time, lengthen equipment life for you. Just call your local representative or write any company listed below:

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20 • **STANDARD OIL COMPANY OF TEXAS,** El Paso
THE CALIFORNIA COMPANY, Denver, Colorado

TRADEMARK "RPM" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

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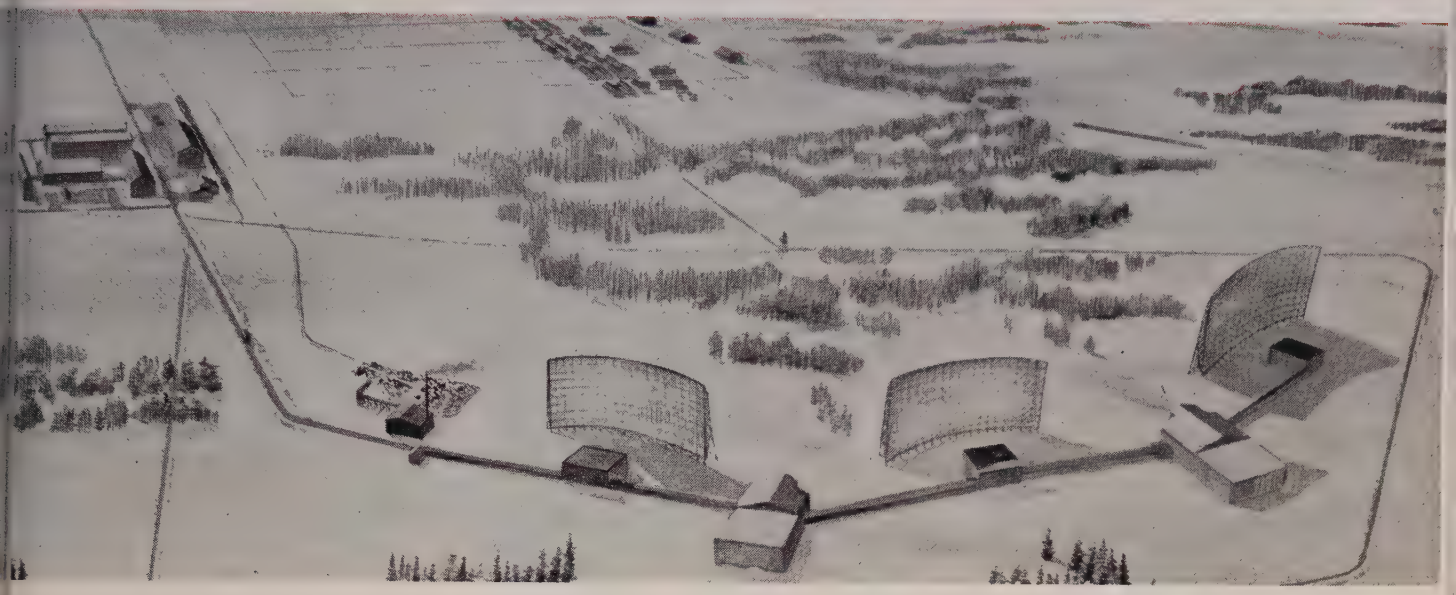
WESTERN CONSTRUCTION

NOVEMBER, 1960



The challenge of building BMEWS

At the Clear project in Alaska, Baker & Ford faced a tight schedule on a job important to National defense. The usual problems of Alaskan construction, and some that were unforeseen, were met by combining careful planning and selected supervisory personnel.

BY L. A. "LARRY" BERNARDI
Project Manager, Baker & Ford
As told to
CLIFFORD S. CERNICK
"Alaska Newsletter"

THERE ARE MANY THINGS about being a major contractor on construction of the Clear Ballistic Missile Early Warning Station (BMEWS) vastly different from other projects I've worked on in Alaska, and elsewhere.

For one thing, Baker & Ford has never been charged with a project so important to continental defense and security — and one in which meeting rigid construction schedules and maintaining the highest possible quality of performance were such vital requirements. Published information about the BMEWS system is such as to offer the greatest possible challenge to any American contractor.

Purpose of BMEWS

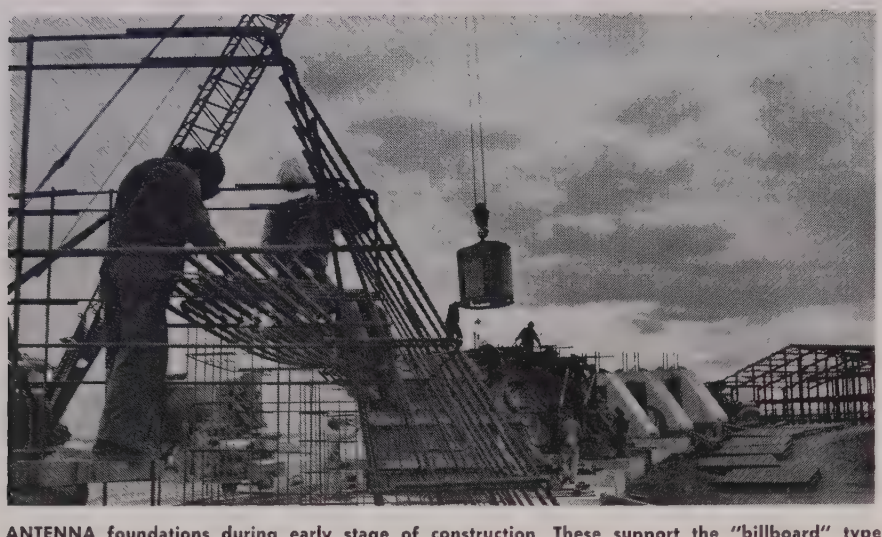
This system was designed to detect, identify and track enemy ballistic missiles aimed at Canada and the United States and traveling at speeds up to 18,000 mph. The job at Clear called for construction, basically of three huge radar antennas, two transmitter buildings, one of which included a computer section; a large composite building to house personnel operating the station and a 22,500-kw. power plant to generate the tremendous surge of power required for operation of the warning system.

Each of the three dish-shaped, billboard-type antennas is 165 ft. high and 400 ft. long. A total of 20 backstays and 20 trusses were required for support of each of the 1,500-ton steel reflectors.

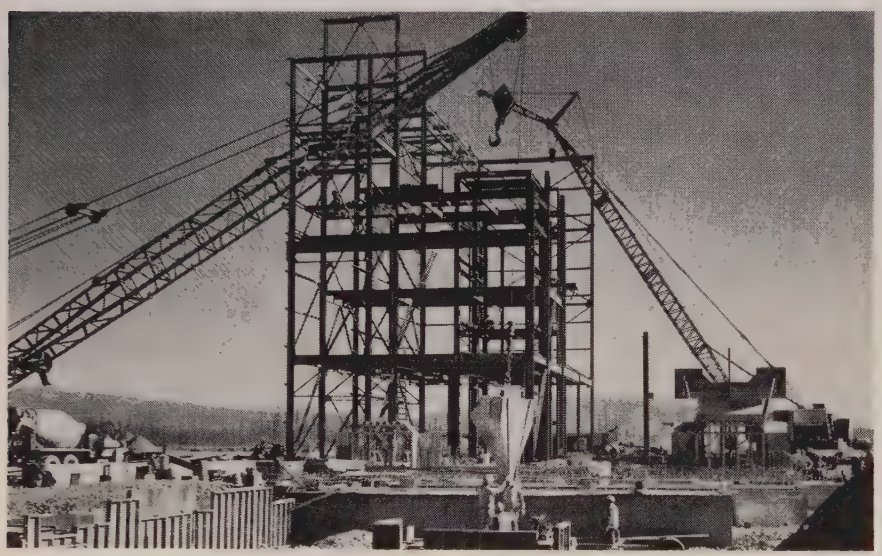
Jets of radio-frequency energy are fed to the big reflectors from scanner buildings located in front of each antenna. The reflectors radiate fans of energy at two different degrees of elevation above the earth's surface. When a missile passes the lower fan, radar pulses bounce off it. These radar echoes, picked up by super-sensitive receivers provide data on the position and velocity of the missile. Seconds later, as the missile passes the upper fan, radar echoes again pick up the missile and measure its velocity.

All of this is done at ranges up to 3,000 nautical miles, providing from 15 to 24 min. warning of an impending missile bombing — time enough to alert the U. S. Air Force's North American Air Defense Command, Strategic Air Command and Civil Defense agencies.

It was no wonder that the highest possible priority was assigned to this construction effort, Alaska's biggest single project for the current construction season.



ANTENNA foundations during early stage of construction. These support the "billboard" type of antenna that are 400 ft. long and 165 ft. high.



POWERHOUSE frame under erection, early last spring. An output of 22,500 kw. is required to provide the surge of power required to operate the warning system.

Project at Clear

The BMEWS project at Clear, located on a wooded, alluvial plain of the Nenana River 70 mi. southwest of Fairbanks, was the second to be authorized. The first, at Thule, Greenland, is scheduled to become operational this year. Clear is scheduled for completion by next summer.

Because of the nature of the project and its security aspects, a great deal of attention was focussed on bidding activity. Up to the time we submitted bids on the Clear project, our firm, which has its headquarters in Bellingham, Wash., was not too widely known in Alaska, or elsewhere outside the State of Washington, for that matter.

Our anonymity evaporated when we found ourselves possessors of four of the initial contracts at Clear. Overnight, we became the target for job-hunters and newspaper reporters. One Alaska newspaper even published a glowing editorial about our firm, congratulating us on our rise from obscurity.

But possession of a raft of contracts on one of America's largest, most vital defense construction projects did not inspire undue jubilation in our ranks. Instead, from the outset, we looked at Clear as the biggest challenge our growing organization ever faced. And we looked at it, too, in the same deadly-serious manner in which it was regarded by military officials.

At present we are completing work on more than $20,000,000 in contracts at Clear. Included are contracts in the amount of $5,036,174 for construction of two radar transmitter and computer buildings, $3,666,499 for the composite building which includes dormitory space for 600 men; $836,475 for construction of antenna foundations and $342,678 for a second composite building.

On all these, and subsequent contracts, our bids were substantially below the government's estimate for this work. At first, there was considerable skepticism in some quarters as to our ability to carry out construction of major buildings, campsite housing, quarters and warehousing at Clear on the tight schedules required, and still remain in the black.

It is my pleasure to report that despite numerous problems and setbacks none of us could have foreseen, we are not only on schedule but ahead of schedule and at this writing our over-all work at Clear is 95% complete.

Improvements in construction methods, learned the hard way in many instances, paid off at Clear. Alaskan experience in excavation and earth moving was extremely useful when we began work on the antenna foundations. Permanently-frozen layers of earth — or permafrost — were so thick in the vicinity that in some instances we had to excavate to a depth of as much as 35 ft. The undependable permafrost had to be removed and replaced with material providing the required support.

Baker & Ford's portion of this work consisted merely of the foundations. RCA had the contract for erection of the antennas themselves —and they, in turn, subbed out the work to Mocel, a joint venture of Manson-Osberg, City Electric Co. and Lent Mechanical Contractors.

When we began operation at Clear around May 1 of last year, one of our first jobs was to set up a batch plant and a borrow pit. As our projects got under way, we quickly discovered one of those "unforseen" conditions referred to above. Because of the prevalence of permafrost, we had to do about twice as much excavation as we had originally estimated was necessary. This amounted to about 260,000 cu. yd. of excavation and 300,000 cu. yd. of back-fill.

Planning was the key

Careful planning of each phase of the job in order to get the most out of men and equipment — and chalk up as much progress as possible—was one of the ways we were able to counteract such initial setbacks. An illustration of how this was done in one instance was our

approach to the problem of providing an adequate foundation for the pedestal of a giant tracking radar planned for ultimate construction on top of the transmitter buildings. The greatest possible stability for this pedestal was required since the antenna and its pedestal weighed over 300,000 lb. An additional factor dictating the need for stability was the fact that the antenna for the tracking radar, unlike those on the detection radar, is not fixed but rotates constantly.

Work on the pedestal foundation had to proceed with all possible speed. Nothing could be done on construction of the transmitter building itself until this was out of the way, since excavation required for the pedestal took up virtually the entire building area.

After excavating to a depth of 25 ft. below the point at which the bottom of the pedestal was to go, we began pouring the concrete foundation slab. To do this with the greatest possible efficiency and speed, we decided to set up a regular 34E paving mixer under the batch plant and load directly into dump trucks at the plant.

We dozed a ramp into the excavation. After the concrete was dumped, the truck returned to the plant by way of another ramp, providing a continuous, smooth concrete-pouring operation. A small tractor and compactor were used to spread and shape the foundation.

We averaged 100 yd. an hour from the batch plant and paving mixer in this instance. Within 104 hr. on a round-the-clock basis, we were able to pour the 20,000 cu. yd. required for pedestal foundations as well as supply about 12,000 yd. to other contractors.

Each of the towers contained over 40 tons of reinforcing steel in the base slab. Placement of the steel moved along smoothly with the concrete pour. Had we used any other method of operation, I'm convinced, we would have been thrown behind schedule.

Although the supply of personnel in most crafts was no problem, we had difficulty finding an adequate number of welders.

Use of tilt-up

Another important time and cost-saver on various segments of the Clear project, we found, was the use of precast, tilt-up slabs. For example, in the 300-man dormitory wings and in the kitchen and administrative areas, we had the option to go either block or tilt-up. We decided on the latter.

TILT-UP construction was used extensively to meet the tight time schedule. Careful study showed that the method could be applied to several units ordinarily overlooked—such as stairwell enclosures, firewalls and interior walls. The picture shows work on 300-man housing wings.

Prefab forms were constructed in Bellingham and shipped north, resulting in considerable cost savings at the start. We made a point of using the tilt-up method wherever we could and after looking around were successful in discovering a number of places ordinarily overlooked in this respect. For example, we found that stairwell enclosures, firewalls and interior walls all offered such possibilities. Our warehouse job at Clear was 100% tilt-up.

Tilt-up panels were poured away from the site on a casting table; we formed decks along with the casting so that casting and forming time was cut about 30%. We found that another time-saver was pouring of the furring strip into the concrete. Prefab panels were hoisted into place with a crane, then fastened in place. Once crews became accustomed to the pattern of this work, it went extremely fast.

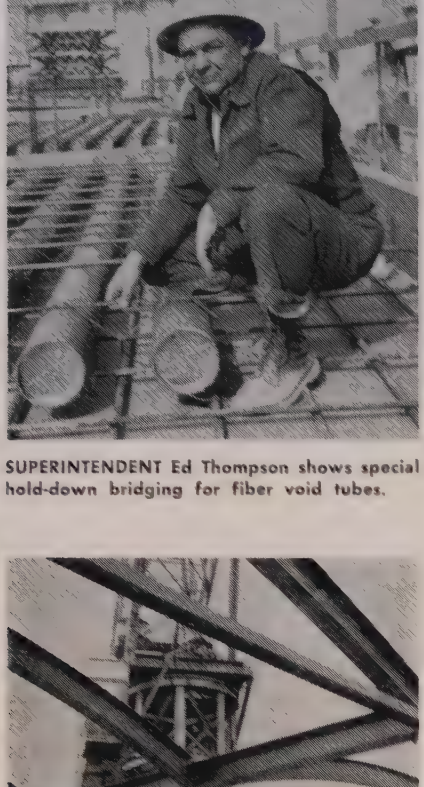
Last winter, even though temperatures dropped to 30 and 40 below zero, we were in no position to do any coasting. We found that certain operations could proceed almost as efficiently in winter as in summer. For example, in the dead of winter we were able to get steady production of prefabricated panels out of a heated shop which we converted into a prefab "factory." We set up a portable batch plant, using steam coils to heat the sand and aggregate and brought in hot water from the steam plant. We figure we gained approximately six weeks by utilizing to the fullest possible extent the heated shops and other facilities during the winter.

A costly fire

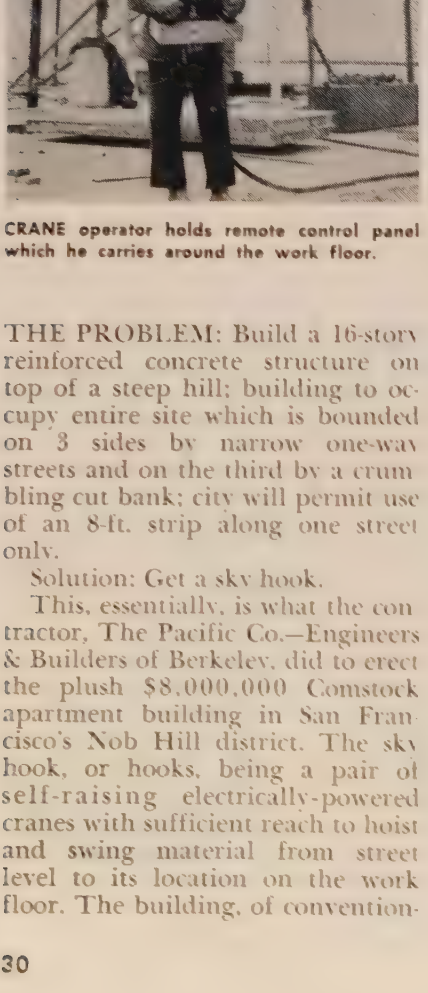
By May of this year, we found

(Continued on page 32)

SUPERVISING the project for Baker & Ford are Larry Bernardi (right), project manager and author of this article, and (left) Nick Ference, general superintendent.



SUPERINTENDENT Ed Thompson shows special hold-down bridging for fiber void tubes.



CRANE operator holds remote control panel which he carries around the work floor.

GET A SKY HOOK!

Material handling problems of constructing a 16-story reinforced concrete apartment building in a cramped site solved by two self-lifting cranes.

THE PROBLEM: Build a 16-story reinforced concrete structure on top of a steep hill; building to occupy entire site which is bounded on 3 sides by narrow one-way streets and on the third by a crumbling cut bank; city will permit use of an 8-ft. strip along one street only.

Solution: Get a sky hook.

This, essentially, is what the contractor, The Pacific Co.—Engineers & Builders of Berkeley, did to erect the plush $8,000,000 Comstock apartment building in San Francisco's Nob Hill district. The sky hook, or hooks, being a pair of self-raising electrically-powered cranes with sufficient reach to hoist and swing material from street level to its location on the work floor. The building, of conventional reinforced concrete design, is 120 x 275 ft. in plan, set back above the third story to 86 x 225 ft. Floors are 13 in. thick incorporating 8-in. diameter fiber tube voids on 12-in. centers. They are supported by columns on 26-ft. centers. Building includes a shaft for three elevators, 2 stairwells and interior concrete partition walls on each floor, and utilizes 16,000 cu. yd. of concrete, with rebar and forming materials in proportion. These, together with quantities of imbedded plumbing and conduit and tons of finish material, constitute a ticklish material handling problem in a confined site.

Hence, the sky hooks. The two Universal-Liebherr electric cranes were installed in the stairwells at opposite ends of the building. The crane consists of a steel girder-like pedestal 4 ft. square and about 40 ft. tall, made of 10-ft. sections bolted together. A ring section around which the crane revolves fits around the top. Cable drums and electric motors are sharply offset from the pedestal to act as counterweight for the long truss-type boom which has a 98-ft. reach at maximum declination (15 deg. above horizontal). Crane boom is raised and lowered by a pair of hydraulic cylinders placed forward of the pivot point. A tiny glass-enclosed operator's cab is mounted forward of the pedestal, but this is rarely used, for the controls are grouped in a portable control panel and connected to the crane by a long cable. A shoulder harness permits the operator to strap the panel on

like an accordion, and operate the crane from any point.

The steel shaft on which the crane sits is held in place by three steel collars placed at the work floor and the two floors immediately below. In the Comstock installation, each collar rested on two wide-flange I-beams spanning the stairwell or elevator shaft openings, and secured by clip angles. The two uppermost collars acted as guides to prevent side sway. Weight of the unit was supported on the bottom collar where short beams were thrust diagonally through the pedestal at each corner, underpinning a wide horizontal brace in the pedestal structure.

Raising cranes

Hoisting the units to a new working position was easily accomplished. With the boom in vertical position, a cable was run down through the shaft, under a sheave at the bottom, and up on the outside and anchored to the top guide collar. Then, as the crane reeled in the cable, it hauled itself upwards. The bottom collar and I-beam supports were dismantled and reassembled at the top floor. (Each collar unbolts into two halves for this purpose.) Cranes were delivered and installed by G. W. Thomas Rigging Co., which also supervised hoisting the units from floor to floor. These "jump-up" moves were handled by two men and the operator.

Project superintendent Ed Thompson had planned to use his two fixed cranes to place all concrete, moving the buckets directly from the street to position over the forms. However, the limited capacity of the cranes, ¾ cu. yd. at full 98-ft. reach, was not fast enough to handle the 13-in. floor pours.

They were supplemented with a buggy spread supplied by a 75-ton truck crane placing concrete in a hopper at the construction floor. To clear the void tubes in the floor forms, buggies traveled on plywood panel runways spanning short 4 x 4 timber bents which fit tightly between the fiber void tubes in the form and required no other supports. Panels were reinforced on the underside with 2 x 4's running lengthwise. They were butted together at the bents and tack nailed with cleats at the edge. Runways were quickly set up and knocked down, and easily moved from floor to floor as construction progressed.

Buggies placed about two thirds of each floor area, while cranes handled the remaining one third, working the areas on the opposite side of the delivery point.

Concrete was supplied by Pacific Cement and Aggregates Co. in transit-trucks from nearby plants. With local sources, the concrete was available in quantities sufficient to keep the buggy spread and the cranes operating simultaneously.

Form work

The first three floors of the big apartment building are used for parking, with lobby and building offices on the street floor. Above the third floor, the structure is set back to form a rectangular tower containing a service floor, and 12 identical residential floors. A penthouse of barrel roof design framed in structural steel caps the building.

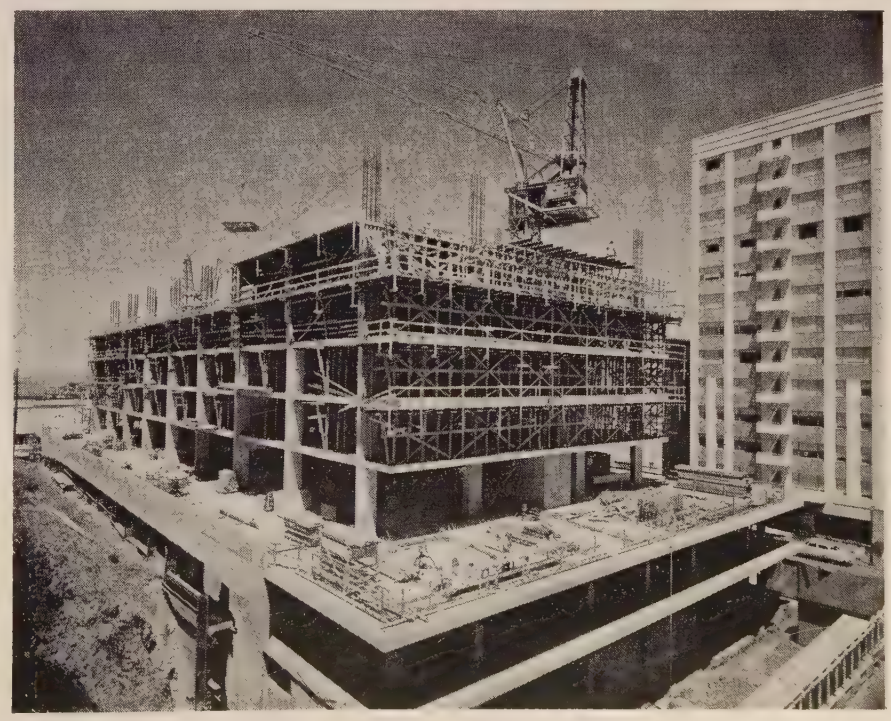
Floor forms were erected on 4 x 4 timber posts and caps, lined up with the concrete supporting columns at 13-ft. intervals. (Columns are on 26-ft. spacing) Spanall horizontal steel shoring cross members were placed on the caps, and these, in turn, were bridged with 2 x 4's laid flat. Additional 2 x 4 spacers were placed on the timber cap between the Spanall shoring members. Plywood panels ⅝ in. thick were placed on the supporting structure and held in position with a single nail at each corner.

Shoring was dismantled in two stages, the first taking place five days after the pour was completed when Spanall members, 2 x 4's, and most of the plywood form panels were removed. Use of spacers over the timber caps permitted withdrawal of the cross-members without disturbing the main timber shoring which remained in place 28 days, allowing the concrete to attain design strength — 5,000 psi. through the first 8 floors, 3,000 psi. above that level. Floor forms used a minimum of fastenings for swift dismantling and re-erection.

Void tubes, which tend to float to the surface as the concrete is placed around them, were held in place in the floors with bridging formed of steel rod bent in a zigzag pattern and welded to a straight rod along the top edge. Bridges were placed over the tubes and anchored to the bottom form with hooked form ties.

Columns and interior walls were formed with job-made plywood and timber panels. Since all floors above the setback are identical in plan, forms were built in sections of convenient size, removed intact and reused.

The building advanced at the rate of one floor every 8 days. In order to meet this schedule the contractor poured walls and columns and even floor sections in small groups. Most of the partition walls



EARLY progress photo shows crane in action. Note bulkhead in front of foundation wall at left. Bracing was installed to hold extensive slide at start of project.

were divided by ceiling-high doorways into smaller units which could be poured without waiting until the entire wall was formed. Minimum pour was 10 cu. yd., and as soon as forms were ready for this amount or more, the concrete was placed.

Piecemeal placing enabled the contractor to keep one of his two fixed cranes free almost continuously for material handling work, unloading the stream of subcontractors' supplies arriving at the job; as well as moving forms, lumber and supplies from floor to floor. To speed material handling, timber landing stages were built projecting from the edge of the building at each floor, where loaded dollies were spotted for easy access to the crane. During major floor pours, usually lasting 4 hours, all material deliveries were banned.

One of the most useful tools on the job is an elaborate telephone intercom system installed by Communication Service Co. of Oakland on a lease basis. The system comprises a dial telephone and independent loud-speaker on each floor plus a phone and control box in the construction office. All the stations in the system can be dialed from any phone. In addition, there is a "paging" number which activates all the loudspeakers. Thus, when the superintendent in the office wants to talk to a man on the job, he dials the paging number and asks the wanted man to dial the office. This message is broadcast on all floors and is loud enough to be heard over the usual construction noises.

Personnel

For the Pacific Company—Engineers & Builders, Ed Thompson is field superintendent; Jack Childers, carpenter foreman; Carl Dybal, finish foreman, Lionel Tevis, labor foreman; and Paul Gunn, timekeeper.

Principal structural subcontractors and suppliers include: Pacific Cement and Aggregates Co., San Francisco, concrete and Richvoids; Herrick Iron Works, Hayward, reinforcing steel; Moore Dry Dock Co., Oakland, structural steel; and Universal Leibherr, Inc., Zeleinopole, Pa., cranes.

The architectural firm of Hammarberg & Herman, El Cerrito, Calif., designed the project. Structural engineers are Simpson & Stratta, San Francisco.

BMEWS

(Continued from page 29)

ourselves comfortably ahead of schedule when again it was demonstrated to us that no matter how well you're doing, you can't afford to coast. A costly fire, caused by sparks from a welding torch, broke out in the transmitter-computer building. Tremendous heat generated by the blaze warped and distorted more than 50 tons of structural steel already in place. To rip out this steel and replace it would have required dismantling of about 300 tons of steel —and would have, in the process, put us dangerously behind on the job.

Fortunately, however, the Army Corps of Engineers had heard about a retired blacksmith, 74-year-old Joseph Holt of Snohomish, Wash., who had his own method of straightening steel girders without dismantling them.

A phone call was placed to Holt and he agreed to fly to Clear along with his son, the Rev. Fred Holt of Idaho Falls, Idaho, and a crew of welders. In 22 days of painstaking work the job was done — and again we were able to remain ahead of schedule.

Holt's method of operation is worth summarizing briefly. Beams were straightened by application of selected heat patterns with an oxyacetylene torch. A small section of the beam is heated to a temperature of about 1,200 deg. Fahrenheit. This causes the heated portion to expand, but since the main section of steel around it is relatively cool it remains unaffected. Consequently, the heated area expands within itself, so to speak, and upsets. Upon cooling, this portion attempts to contract, but since the surrounding steel does not move, it develops a tension. The heat is moved to the next position and the process repeated. This places an entire section under tension until a point is reached where it can relieve itself only by shortening.

Personnel was the key

A key factor in efficient operation on any contracting job is a recognition of the importance of choosing well-qualified men, not only in supervisory capacities but all down the line to the ranks of laborers and other unskilled categories. Baker & Ford has a policy of screening its employees very carefully.

On contracts such as ours, it's imperative that every man pull his own weight. Though incompetents and shirkers occasionally slip through, they don't last long. The attitude of supervisory personnel is, of course, all important. It is not enough that they be men of long experience in the construction field. They must also know how to get a job done with the least amount of fuss, to look at obstacles as though they were a personal challenge, to find new and better ways to get the job pushed through.

We believe that a major portion of the credit for our record of accomplishment at Clear can be attributed to the kind of men — in all categories — that we have been able to gather together as a team to do this work. In general, we have found the supervisory teams at Clear to be of the highest caliber.

We have worked very closely and harmoniously with Lt. Col. Joseph A. Bacci, who is resident engineer at Clear for the Army Corps of Engineers and has been in charge of construction work here since the inception of the base in the spring of 1959.

Among the top construction men playing a major role at Clear are Nick Ference, general superintendent for Baker & Ford, and Al Edmiston, assistant project manager.

Mel Braund is superintendent for Patti-MacDonald and Morrison-Knudsen, and Lionel Ruckstuhl is assistant superintendent for that joint venture. Roy Findley is project superintendent for Empire Gas Engineering Co., contractor on the Clear power plant.

Keeping equipment in topnotch condition also has been very important to us. Our roster of equipment includes four Cat D-8 dozers, a D-9 and a D-6. We also have 7 Caterpillar scrapers—3 DW-21's and four DW-15's.

We were able to put seven cranes to good use. Four of them were on rubber and the others crawlers. One of the cranes, a Bucyrus Erie 30-B, 45-ton job, mounted on rubber, was the largest of its kind in Alaska. Vehicles included a total of 14 Mack trucks, six with mixers, seven dumps and one flatbed.

It has been a source of genuine pride to the Baker & Ford organization that we were able to meet the challenge offered by the Clear construction project — and meet it successfully.

DOWNSTREAM view of dam site showing major road cuts along right side of canyon. Material for dam comes from borrow area at left.

Preliminaries make highball job

Contractor builds 3½-mi. road requiring 900,000 cu. yd. of excavation to relocate vital highway in preparation for placing 315,000-cu. yd. embankment at Nicasio Dam within 7-month time limit.

IT'S NOT SO MUCH the project as the preliminaries that make construction of Nicasio Dam in coastal Marin County, Calif., a real highball job. The dam embankment itself is of modest dimensions, 120 ft. high with a crest length of 450 ft. and a total volume of 315,000 cu. yd. in its four zones; and the contractor is allowed 202 calendar days, expiring Nov. 15, to complete it.

However, before the contractor could think about placing fill he had to strip and grout the core and abutments and place an 800-ft. steel outlet pipe encased in a heavy concrete structure along the base of the left abutment to carry winter stream flow through the fill.

Before he could place the outlet pipe he had to close the county road which ran directly above the pipe alignment, along the floor of the canyon. Before he could close the existing county road he had to build a new 3½-mi. road along the opposite side of the canyon and above the water line of the new-lake-to-be.

And before he could build the new road he had to make five major cuts across a chain of pot-bellied hills so steep the goats carry lifelines, excavate some 900,000 cu. yd. of material ranging from slippery soil at the surface to solid wet rock.

And this is why the dam site is lighted at night as a work force of 100 men work 2 shifts a day, 6 days a week depositing 6,500 cu. yd. per shift on the embankment.

Contractor on the $1,800,000 job is a combine of Cherf Bros. and Sanday of Ephrata, Wash., and Sacramento, Calif., and Cheney Construction Co., of Seattle.

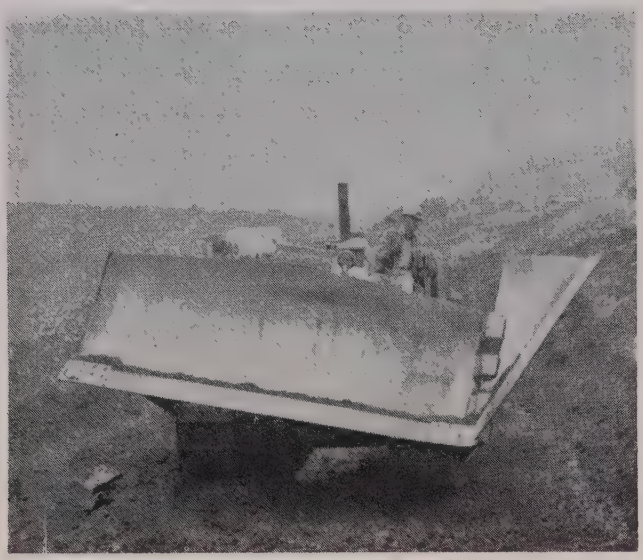
Owner is the Marin Municipal Water District. Although the object of this project is to create a reservoir of 22,000 ac. ft. to supplement the county's water supply, the greater part of its cost is devoted to the supplementary task of relocating the county road around the dam. About $1,000,000 of the total contract is devoted to construction of the road, with the remaining $800,000 covering construction of the dam and spillway.

From the standpoint of time, the critical part of the project is dam embankment. The contract specifies that it be completed prior to the winter rains which could produce dangerous flood conditions with a partly completed fill in the narrow canyon. The sequence of construction, however, was determined by the necessity of keeping open the county road, the only road to the coast in this area.

The contractor surveyed the situation and attacked in force, moving in equipment as fast as it became available from other jobs. At full strength, major equipment on the job exceeds in value the amount of the contract. Key items of equipment were a fleet of 4 Euclid TS24 twin engine scrapers, and a Caterpillar D8 with a special job-made side cutting blade.

The equipment list also covers 3 Caterpillar DW20 scrapers, 1 D9 and 5 D8 crawlers on the road spread, 2 Caterpillar graders, 1 D6 crawler, 1 Allis-Chalmers HD5 front-end loader; 1 Link-Belt truck crane and 1 Manitowoc 3600 shovel; 1 Gardner-Denver and 1 Chicago Pneumatic 600 compressor, 1 Ingersoll-Rand 500 compressor, 3 air-track drills; 3 Euclid R27 end-dump trucks. (Three additional scrapers and 4 crawlers were rented from local contractors at the peak of the road work operations).

The new road alignment running roughly north-south crosses a



SLOPE BOARD used to trip banks on the steep cuts. Job-made trimmer is welded to edge of bulldozer with tilting frame.

FILTER ROCK placed on foundation with aid of tractor which pulls rock trucks through the deposit area. Second tractor spreads gravel.

gently rolling upland basin at the north, extends through the canyon to the south, crossing the face of the steep hills about 150 ft. above the canyon floor. The major cuts are concentrated in the southern canyon area, while much of the fill went into a long embankment about midway in the job where the new road will cross a shallow arm of the reservoir.

The twin-engine scrapers were put to work on the northernmost of the big cuts, through a hill of relatively gentle contours. Caterpillar D8 and D9 ripper-dozers began the ticklish job of pioneering the cuts on steeper ground. It was impossible to get even a twin-engine scraper up the grade to the top of these cuts so the tractor spread worked the gradually lengthening benches down, pushing the material over the side, until a passable haul road could be built.

As soon as a cut was opened to scrapers, the twin engine units were pulled off the preceding cut and moved to the new location, with its steeper grades. Their place was taken by DW20 units. In this sequence (pioneer tractors followed by twin-engine scrapers, and finally single-engine scrapers) the contractor moved through the canyon.

Drilling and blasting

As the cuts deepened, the rock got denser and harder, and rippers gave way to drilling and blasting. Drilling was done with 3 air-track drills. Holes of 2½-in. diameter were drilled on 9x9-ft. intervals to a maximum depth of 30 ft. Holes were loaded with Acromite ammonium nitrate (American Cyanamid Co.) and primed with a stick of Atlas 40% gel. Atlas caps and fuses were used for detonation.

Small underground springs and quantities of wet rock were encountered in the blasting area, requiring use of a water-resistant type of ammonium nitrate. Each pellet of the material is coated with a water-resistant substance. It is free flowing and can be poured in the holes without bagging. It provides moisture protection for several hours, long enough to load and fire the shot. In the wettest areas, where water filled the shot holes, the material was bagged in plastic.

The shot rock was moved with the rubber-tired scraper fleet. Completion of the five big cuts ranging to 120 ft. in depth involved some 880,000 cu. yd. of material, including 300,000 common; 400,000 rippable rock, and 180,000 blasted rock.

Cuts were laid back on a ½ to 1 slope, trimmed with a bulldozer using a special side blade suggested by grade foreman Bill Blair and built in the contractor's maintenance shop. The "slope board" is a wedge-shaped steel plate fastened to the edge of the dozer blade, with the joint strengthened by three ½-in. steel straps welded across the face of the joint. The blade assembly is mounted on a D8 with hydraulic tilting frame which enables the operator to maintain the correct slope. The blade produced a neat uniform slope and easily handled the tough rocky material.

On completion of the cuts, the road was quickly brought to grade. Ironically, construction of the long fill across the lake required additional borrow material despite the nearly 900,000 cu. yd. of excavation.

When the base grade was finished, county authorities permitted the contractor to shift traffic over the new alignment while the sub-

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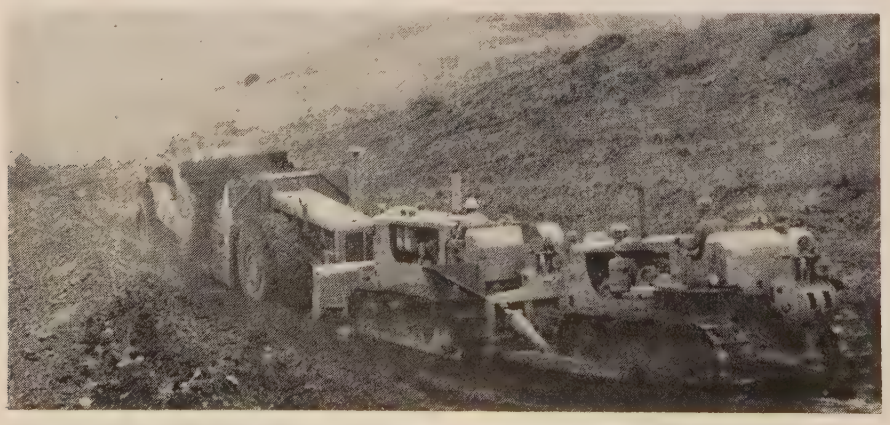


POWER in plenty is available for high speed earth-moving. Here a D9 and D8 push-load twin-engine Euclid TS24 scraper. Scrapers loaded out of gear to reduce tire wear.

SITE of Lower Monumental Lock and Dam Project which will extend the slack-water pool another 28 mi. up the Snake River. With an effective height of 93 ft. and an initial power installation of 270,000 kw. to be on the line in 1967. Dam length will be 3,800 ft.

Start on Lower Monumental Dam

Appropriation will permit active construction to begin on Lower Snake River lock and dam project. Located above Ice Harbor Dam, the power plant will have an ultimate rating of 726,000 kw. Work will be in three stages, with power on the line in 1967. Cost will be about $150,000,000.

By COLONEL PAUL H. SYMBOL, DISTRICT ENGINEER
U. S. Army Engineer District, Walla Walla
Walla Walla, Washington

LOWER MONUMENTAL Lock and Dam on the Snake River in eastern Washington is one of the new starts in the U. S. Army, Corps of Engineers' water resources development plan for the Northwest. The dam site takes its name from a huge mass of volcanic rock that overlooks the Snake River a short distance above the dam site. A similar but smaller rock exists a few miles on upstream, hence the "lower" modifier. In the early days of the West, the Monumental Rock area was a rendezvous for Indian hunting and fishing parties. The name Lower Monumental is thus dually appropriate, for both the scenic surroundings of the site and the historical background of the river region.

Lower Monumental, located in the Walla Walla Engineer District of the North Pacific Division of the U. S. Army, Corps of Engineers, was authorized as a water resource development project by the River and Harbor Act of 1945. It was not until 1957, however, that it received funds to the extent of $255,000 for planning and design studies. In 1958, planning funds of $500,000 were allotted to the project, and in 1959 a further $550,000 was made available. Then 1960 followed, with an increased allotment of $830,000 for detailed design and planning. In FY 1961 an appropriation of $1,000,000 was made for the start of actual construction work on the project.

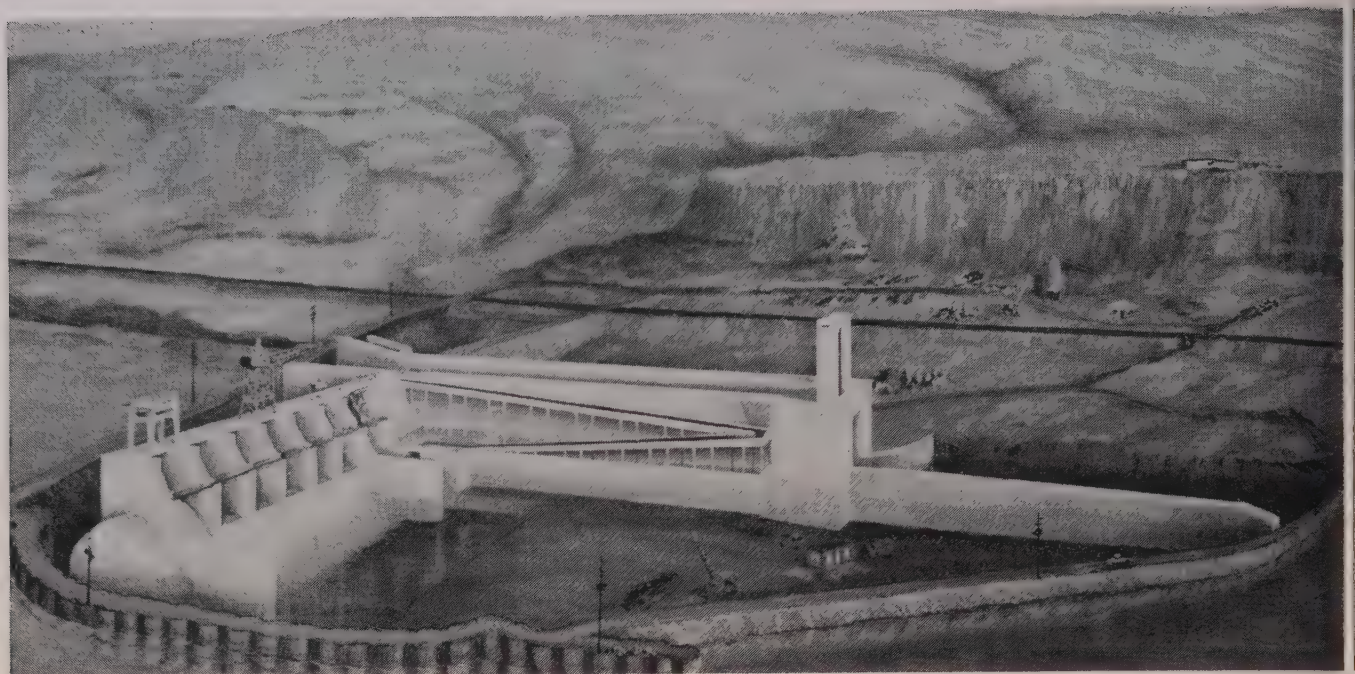
Lower Monumental Dam is located on the Snake River at river mile 41.6, at the head of the Ice Harbor Dam pool, 31.9 mi. upstream from the Ice Harbor Dam site. Ice Harbor Lock and Dam is well past the three-quarter completion mark, and there seems little doubt but that it will realize its scheduled target of power on the line by late 1961.

Detailed studies on the Lower Monumental project as a separate unit of the Lower Snake River water resource development plan was initiated under the fiscal year 1958 appropriation. This study indicated that the most favorable site along the upper head reach of the Ice Harbor Dam pool was at river mile 41.6. Reservoir surveys were made above and below the selected Lower Monumental site and detailed river soundings in the area carried to completion. These studies led to the establishing of the optimum level for the Lower Monumental pool and the interrelated siting of Little Goose Dam.

Little Goose Dam will be the third upstream dam in the river development scheme, which called for a total of four multi-purpose dams to completely harness the Lower Snake hydrologically and establish a slack-water thoroughfare to the Lewiston, Idaho-Clarkston, Washington, area, 145 mi. above the mouth of the Snake.

Power benefits important factor

Construction of Lower Monumental Dam and its power generating facilities will complete the second unit in the Corps' hydro-



FIRST STAGE—South shore navigation lock, fish ladder and 8 spillway bays shown behind the south-shore cofferdam, in this artist's concept. Initial contract will be for access roads on this south shore, followed by a call for bids on the cofferdam and work behind it.

FACTS AND FIGURES

GENERAL	
Stream miles from mouth of Snake River	41.6
River miles upstream from Ice Harbor Dam	31.9
Drainage area, square miles	108,500
Length of dam at crest, feet	3,800
Normal height headwater to tailwater, feet	100
Maximum river flow of record (cfs.)	409,000
Standard project flood	340,000
Spillway design flood	850,000
RESERVOIR	
Elevation, normal pool	540
Area at normal pool (flat), acres	6,590
Relocations, miles:	
Railroads	63.1
Roads	19.7
SPILLWAY	
Bay width, feet	50
Over-all width, feet	508
Gate size, feet	50 x 59
POWERHOUSE	
Length over-all, feet	695
Width over-all, feet	267
Turbines:	
Type	Kaplan, 6 blades
Horsepower	190,360
Generators: Rating, name plate, kilowatts	121,000
Units installed complete initially	3
Initial capacity (kw.)	363,000
NAVIGATION LOCK	
Length, feet	675
Width, feet	86
FISH FACILITIES	
Width of ladder, feet	16
Number of ladders	2
Slope	1 on 10
COSTS	
Initial (3 completed and 3 skeleton units)	$151,000,000
Ultimate (6 completed power units)	$175,000,000

electric development plan for the Lower Snake downstream from Lewiston. Average operating head of Lower Monumental will be about 99 ft., with an average mean monthly regulated stream flow of about 42,000 cubic feet. With minimum and maximum river flows varying from 11,000 to 180,000 cu. ft. per sec., this provides a possible peak power potentiality at this site of over 750,000 kw.

The initial powerhouse installation calls for three generating units rated at 121,000 kw. each for a total of 363,000 kw. In addition, it provides for three skeleton units for further expansion to an ultimate six unit power plant, totaling 726,000 kw. name-plate rated capacity. Full plant capabilities, both initial and ultimate, will be at least 15% greater than rated capacity.

Navigation benefits

Completion in 1961 of Ice Harbor Lock and Dam at river mile 9.7 will permit the utilization of that reservoir for commerce, navigation, and industrial development of river shore sites. With commissioning of the Ice Harbor Lock, navigation upstream on the Snake as far as Lewiston and Clarkston during the spring high-water periods will be possible. Initial development along the Snake River shore line, industrially and agriculturally, inviting to commerce and beneficial to both rail and water traffic alike, should logically be enhanced.

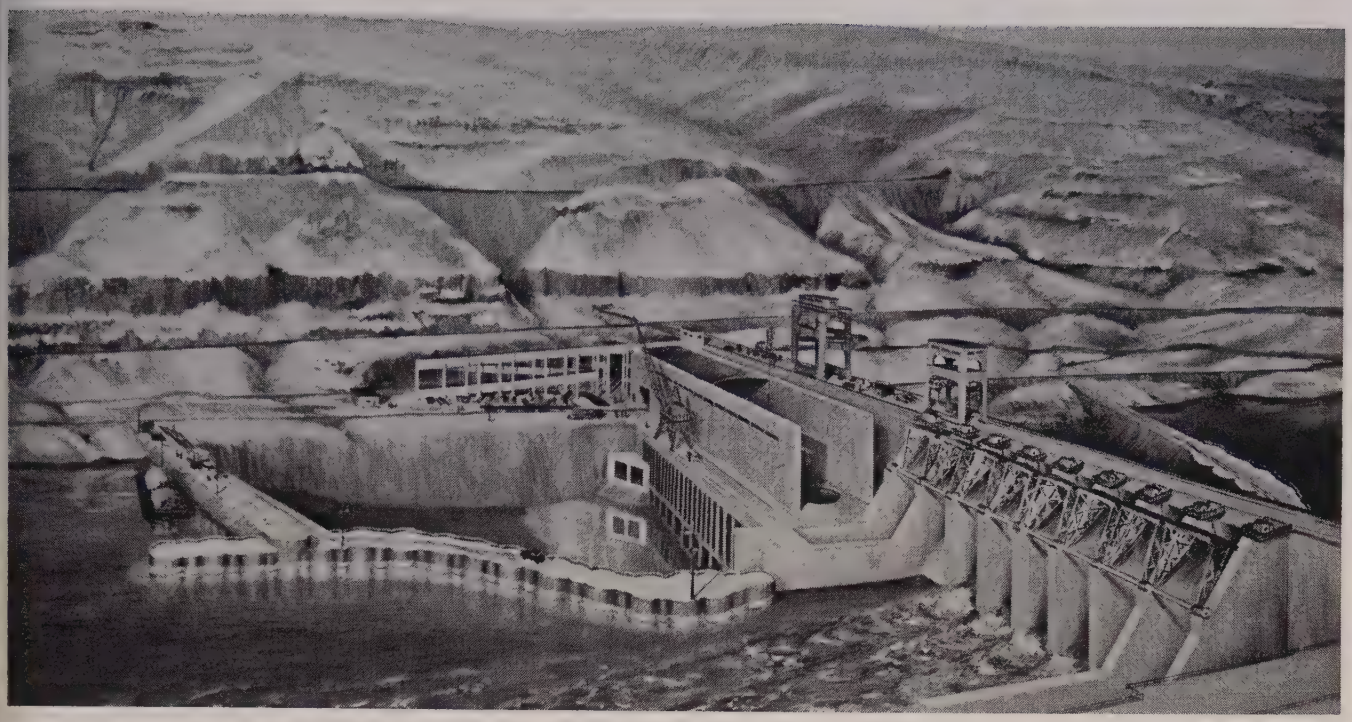
Plan similar to Ice Harbor

The detailed design plan for lower Monumental, while generally following the design plan for Ice Harbor Lock and Dam downstream, completely reverses the Ice Harbor layout.

In design, Lower Monumental, from south shore to north shore, begins with an earth and rock embankment. The earth abutment joins to the navigation lock, which will have an inside clearance of 86 ft. by 675 ft. long. North of the lock will be a concrete non-overflow section 140 ft. in length followed by eight spillway bays. The spillway structure will have an ogee section with crest at elevation 483. The stilling basin below the spillway will be 201 ft. in length.

Spillway control will be afforded by tainter gates 50 ft. wide by 57 ft. in effective height. The spillway is designed for a capacity of 850,000 sec. ft. at a maximum pool elevation of 548 ft. and will pass 666,000 sec. ft. at normal pool elevation of 540.

A concrete non-overflow section 30 ft. long north of the spillway will be followed by a powerhouse 695 ft. long, housing three completed units and three skeletonized units. An erection station and service bay 149 ft. long will also be provided. North of the powerhouse, a concrete non-overflow sec-



SECOND STAGE—On the north shore this artist's rendering shows the powerhouse, north-shore fish ladder and the non-overflow section. Eleven cofferdam cells will be common to the work during both construction stages.

tion with an earth and rock embankment will extend to the right abutment.

The south shore fish ladder will be between the navigation lock and the spillway. The north shore fish ladder will be landward of the powerhouse. Normal pool elevation for Lower Monumental will be 540, with a drawdown pool elevation provided to 537. Maximum pool for the spillway design flow of 850,000 sec. ft. is elevation 548. Normal effective height of the dam is 100 ft. from normal pool elevation 540 to the Ice Harbor pool elevation of 440.

General structures

The Lower Monumental Dam site is in an area where the Snake River has entrenched itself to a depth of about 800 ft. below a rolling plateau. The bedrock of the region is basalt lava flows of the Miocene Age. These are sheet flows covering large areas at the location of the site, normally less than 100 ft. in thickness, but cumulatively into a thickness of several thousand feet. In its core borings no rock types other than basalt occurred at the site or at the reservoir. The width of the valley between bedrock slopes is consistent for many miles. The river itself occupies only a fraction of the valley floor and flows between terraces underlain by sand and gravel or silt strata.

The spillway will have an overall length of 484 ft. and consist of eight bays with 50-ft. openings along with seven concrete piers 14 ft. thick. The ogee will be of standard high-dam shape. Spillway deck will be set at elevation 553 and provide 5 ft. of freeboard over maximum pool elevation. The tainter type gate control will be provided with individual hoists operating from a remote control station with the aid of a closed TV circuit. The stilling basin will be of horizontal apron type, with a sloping end sill.

The navigation lock will be located on the south shore of the river with the center line of the lock approximately parallel to the existing river bank. The location of the lock will provide a straight line approach for 2,500 ft. upstream and 3,000 ft. downstream. The lock will be comparable to the single lift high head lock now under construction at Ice Harbor. The minimum depth over the upstream and downstream sills will be 15 ft. and maximum design lift will be 103 ft.

Owing to the low elevation of bedrock, an upstream floating guard boom, similar to one designed for Ice Harbor, will be used and will extend about 700 ft. beyond the lock gate. Top of the floating section maintained 8 ft. above pool level. Pool conditions will insure an upstream lock approach in excess of minimum requirements of 250 ft. in width and 16 ft. in depth. Downstream excavation will provide a channel 250 ft. wide and 16 ft. in depth below minimum tailwater, extending into the Ice Harbor pool.

The vertical lift gate adopted for the downstream closure of Lower Monumental Lock will be similar in design to Ice Harbor. The gate will have a height of 83 ft. and will extend from sill elevation to a seal point on the upstream face of a heavy girder extending between the lock walls. Bottom of the girder provides a clearance of 65 ft. over Ice Harbor normal pool. This setting also provides 55-ft. clearance over tailwater elevation at a 300,000 sec. ft. flow.

The upper lock gate will be a submergible type gate 20 ft. high. This lock gate will be adaptable to use during the second step construction when the lock will be operated with a low sill. The top of this gate can be raised 2 ft. above normal pool. The emptying and filling system for the lock will be controlled by reverse tainter valves, all of which may be isolated by stoplogs above and below the valves.

Power potentiality

In general design, the power facilities at Lower Monumental will be patterned after those at Ice Harbor. The initial plant capacity will

be 417,450 kw., with the ultimate capacity 834,900 kw. Rating of generating units at 95% power factor is 121,000 kw. each.

Initially, the powerhouse will consist of three generator bays and an erection and service bay, all completed within the superstructure, and three skeleton units. All generator and skeleton bays will be approximately 267 ft. in width from the upstream face. The erection bay will be about 300 ft. wide and the service bay will be approximately 236 ft. in width. The erection bay will be 88 ft. in length and the service bay 61 ft. in length.

Fish facilities

The fish ladder entrances at Lower Monumental will consist of two 12-ft. bays separated by a 6-ft. pier. The fish ladder will be 16 ft. wide, with a bottom slope of 1 to 10. The crest of each weir has a section in the center 6 ft. long that is 2 ft. higher than the rest of the weir so that the overflow crest consists of two 5-ft. sections. The base ladder flow is to provide 12 in. of water over the weirs at 66 sec. ft. As the tailwater rises, sufficient water will be added through diffusers in the lower section of the floor to provide transportation facilities over the submerged ladder weirs. Approximately 830 sec. ft. will be discharged through the ladder entrance at 225,000 sec. ft. of river flow.

CONSTRUCTION STAGE

Construction of Lower Monumental will be prosecuted in three stages: (1) lock and spillway with cofferdam from south shore and the river passing in gap between cofferdam and north shore; (2) powerhouse with cofferdam from north shore and river passing through low spillway bays; and (3) raise low spillway bays and upper lock sill during low water period behind stoplog closures, with river flow through skeleton powerhouse units.

Steel cells will be used for the river legs of the cofferdam where the river velocity is relatively high. The minimum height will be about 30 ft. for the first and second stage cofferdams, with the maximum for the first step about 36 ft. and for the second stage about 57 ft. Eleven cofferdam cells will be common at both construction stages.

The total concrete volume in Lower Monumental Dam will be approximately 1,000,000 cu. yd. Possible sources of aggregate will be both the north and south bank at sites known as Matthews Bench on the left bank and Harder Bench on the right bank. There appears to be over 2,000,000 yd. of coarse aggregate in this area. The deposit contains practically homogenous material consisting of dense basalt stones rounded to sub-rounded.

Lower Monumental Reservoir will extend about 29 mi. upstream from Lower Monumental Dam to the Little Goose Dam site, forming a pool having an average width of over 1,700 ft. and a maximum depth of 120 ft. near the lower end.

Completion target seven years

Lower Monumental's proposed construction schedule from allocation of construction funds to power on the line is set for seven years. The first step cofferdam encompassing the navigation lock will be built so navigation can pass over the low sill during later phases of construction. Six spillway bays will be left low so that the river flow can pass through the area during the next stage of construction. It is estimated this work will take approximately three years.

The second step cofferdam will provide for facilities for the powerhouse, unfinished portions of the spillway and the north shore fish ladder. This construction will also take approximately three years to accomplish. After this work has been completed, the second stage cofferdam will be removed and the river diverted through the three skeleton units while the spillway bays, left low through the first construction step, are raised to finished height. With the raising of these low sills, the pool will be raised, with power on the line by December 1967.

The third step construction, raising of the low spillway bays and upper lock sills, will necessitate closing navigation for about 60 days. Over-all, Lower Monumental construction schedule will emphasize numerous construction cost saving methods, proven in the building of other downstream multipurpose dams. Though there is little difference between the river flow at Lower Monumental and Ice Harbor, with the same amount of available water, Lower Monumental generators will be capable of producing under nameplate rating 121,000 kw., as against Ice Harbor generators 90,000. Advancement in electrical design is accountable for this increase.

NICASIO

(Continued from page 34)

contractor, E. A. Ford, Corte Madera, placed the subbase and asphalt surface, working one lane at a time.

This enabled the contractor to close the old road and get into the dam site itself. Half the abutment work had been completed by a Manitowoc 3500 shovel, working from the new road bed which stripped the abutment down to bare rock. The core had been grouted down to the center line.

The contractor began construction of the outlet structure consisting of a 30-in. steel pipe 800 ft. long, heavily reinforced and encased in a continuous concrete block about 6 ft. square. The contract provides for placing this pipe, which runs along the left abutment about 20 ft. above the bottom of the foundation, prior to starting the main embankment to preserve stream flow. However, during the dry summer the stream had dwindled to a slow seep, and it was necessary to open a small reservoir on a tributary stream below the dam to provide sufficient water for road construction.

Filter rock for the downstream drainage system extending from the impervious zone to the toe of the fill was supplied by a subcontractor who used bottom-dump twin trailer rigs to speed delivery time from sources some 53 mi. away. Dumping these big rigs proved a problem in the short drainage zone and confined area of the dam floor. Dumped material blocked the rigs which could not pull through the loose gravel, and the zone was too short to place material in smaller windrows. The contractor rigged a cable behind a crawler and pulled each rig through the dump area to firm ground on the outgoing haul road. A bulldozer spread the material against the abutment walls.

Most of the fill material for the dam comes from a big spillway excavation directly above the left abutment. The spillway excavation exceeds the dam embankment volume by about 25,000 cu. yd. which will be wasted in a disposal area. Blast rock from the spillway cut will be used for rock zones in the dam as well as to riprap the spillway outlet. Rock will be handled by the Manitowoc with shovel rig loading 3 Euclid end-dumps.

(Continued on page 56)

C-6 service accessibility cuts replacement labor costs, too!

Assuming good shop conditions and experienced personnel, these are typical times for removal and replacement of components in the C-6 and other torque converter tractors of the same class:

Component	Man-Hours C-6	Man-Hours Others
Radiator	3	10
Engine	8	16
Clutch	none	16
Drive Sprocket	8	9.8**
Track Frame	3*	8**

*requires 70 ton press only
**requires special tools and 100 ton press

HOURS SAVED IN THE SHOP MEAN MORE WORK-TIME ON THE JOB!

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

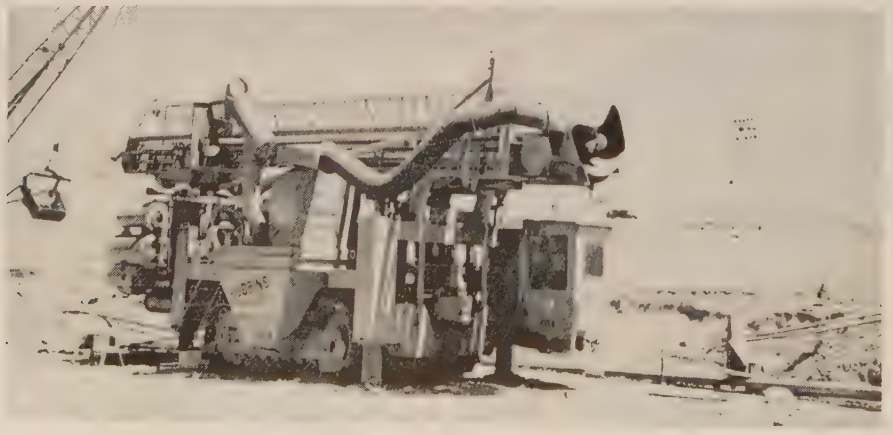
FOR MOVING EARTH, ROCK, COAL AND ORE

. . . for more details, write No. 17 on Reader Service Postcard

Giant drill at Wanapum Dam

World's largest vertical rotary drill is boring 70-ft. deep, 17½-in. diameter holes in bedrock.

WORKMAN stands on platform mounted on floating rotary head. Picture was taken in manufacturer's yard during assembly. Note hydraulic leveling jacks and pipe for dust-removal hose.



MAST IS LOWERED by two hydraulic cylinders in ten minutes for transportation. Dust removal hose is in place. Note rubber shield around bit at upper right. Compressor is mounted at rear.

THE article in the September issue on construction operations at Wanapum Dam on the Columbia River in Washington, mention was made of a machine drilling 17½-in. anchorage holes in rock. Additional details are now available.

The big drill was made by the Robbins Machine & Manufacturing Co. of Oneonta, Ala., which has been designing and manufacturing heavy-duty rotary drills since 1952. The machines to date have been used primarily to sink large-diameter holes in rock for blasting with nitrate explosives. The drill at Wanapum is thought to be the largest vertical drill ever made. It was designed in cooperation with Morrison-Knudsen, sponsoring contractor of the joint venture building Wanapum Dam for the Grant County P.U.D.

The drill is 45 ft. high, 28 ft. long and 14 ft. wide. The weight, including the tractor compressor and drill pipe, is close to 180,000 lb. A rotary head turning a 15-in. diameter drill stem and 17½-in. tricone bit, with up to 400,000 in.-lb. torque, is traversed in the mast with two hydraulic cylinders which by way of a chain linkage apply up to 120,000-lb. pressure on the drill stem and bit.

Compressed air flowing through the drill stem is exhausted through the bit. The expanding air carries the rock chips up the hole around the stem. A dry, suction-type mechanical dust collector gathers the dust and lighter chips, leaving the heavier chips around the hole.

Four hydraulic jacks level the drill on uneven ground. Two hydraulic cylinders can lower the mast to a horizontal position in ten minutes. The mast and compressor can be removed in 2 hr.

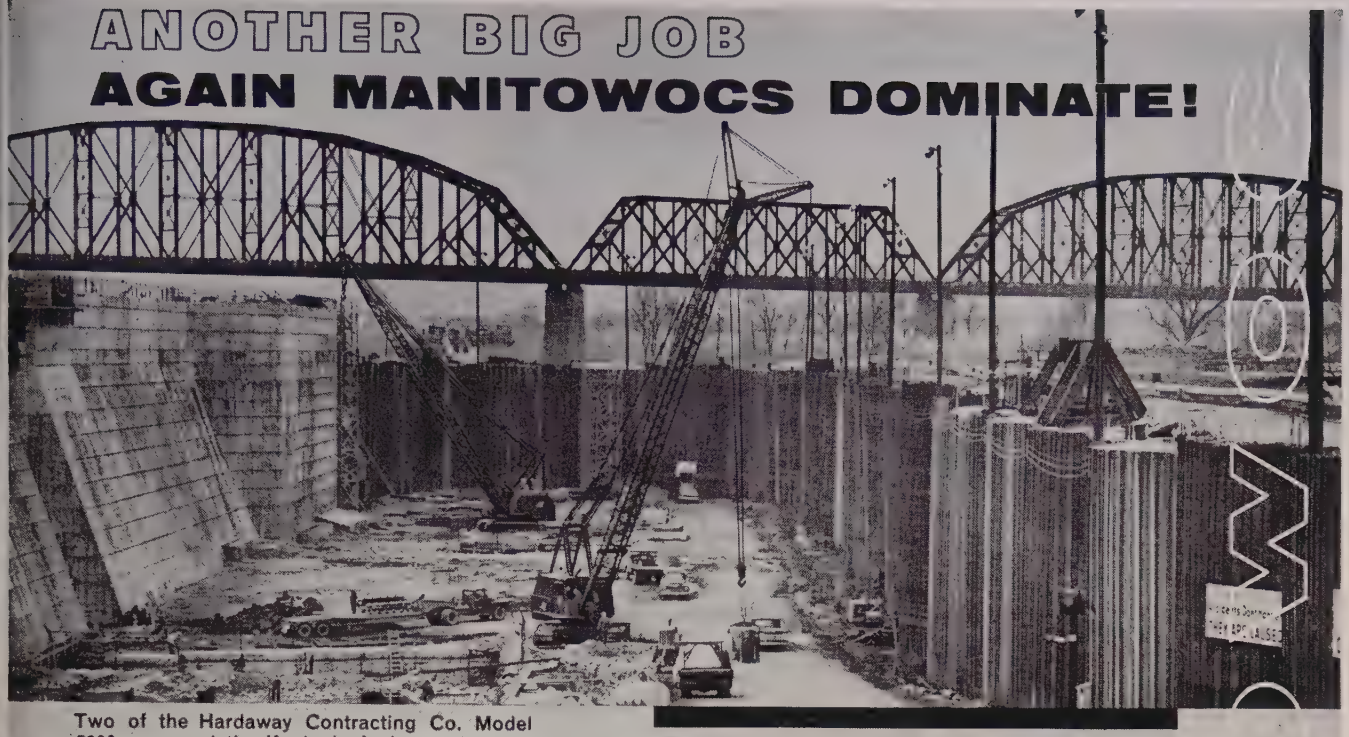
The machine has a winch and pipe-handling platform near the top of the mast for adding and removing 30-ft. sections of drill pipe. The floating rotary head is equipped with a platform and safety rail for lifting workmen to the top. Both drilling and dust control are dry. At Wanapum the machine is drilling at 6 deg. from vertical with a tolerance of ½ in. in 10 ft.

The drilling equipment is adaptable for mounting on any crawler.

(The Robbins Machine & Mfg. Co. is not connected in any way with the makers of the tunneling machine used at Oahe Dam.)

For more information on this large-diameter drilling rig write number 500 on this month's Readers' Service Card.

ANOTHER BIG JOB
AGAIN MANITOWOCS DOMINATE!



Two of the Hardaway Contracting Co. Model 3900 cranes at the Kentucky lock and dam site.

In Louisville, Ky. work has been progressing for over two years on reconstruction of Lock No. 41, just one phase of a billion dollar, long range Ohio River navigation and improvement program. Initial efforts on the complicated, $19,300,000 Louisville job include the construction of four huge cofferdams.

General contractor is the Hardaway Contracting Co., Columbus, Ga. under supervision of the Louisville District, U. S. Corps. of Engineers. The Hardaway Company has been using two Manitowoc Model 3900 cranes exclusively for the cofferdam construction, handling 13 ton templates and the 60 ft. steel sheet piling to form the coffer cells. The cranes also have been placing concrete for both guard and lock walls. An estimated 375,000 yds. of concrete will have been placed before the job is completed.

On another phase of the Louisville project, Traylor Bros., Inc., Evansville, Ind. has been using a Manitowoc Model 4500 Vicon dragline, equipped with a 147 ft. boom and a 5 yd. bucket, for widening and deepening a mile and a half of the upstream approach channel. The drag moves approximately 375 yds. of mud and rock per hour, widening the channel from 200 to 500 ft. An estimated 3,500,000 yds. of earth and 200,000 yds. of rock will have been removed when the job is finished in late winter of 1961.

Manitowoc 4500 Vicon dragline dredges 375 yds. of mud and rock per hour.

Commenting on the performance of the Vicon dragline, Mr. Ford Dyer, Project Manager for Traylor Bros., Inc., said, "We find that the Manitowoc maneuvers better than any other machine of comparable size and that it works 10 to 12 per cent faster." In addition to the dragline, Traylor Brothers have used two Model 3900 Manitowoc cranes at the job site.

On multi-million dollar jobs like this or everyday "bread and butter" jobs, Manitowocs are consistently the choice of contractors needing big output at the lowest possible cost. Be sure to call *your* Manitowoc distributor when you are ready to improve your equipment fleet.

9-C

Manitowoc

MANITOWOC ENGINEERING CORP.

(A subsidiary of The Manitowoc Company, Inc.)
Manitowoc, Wisconsin

SHOVELS	CRANES	DRAGLINES	TRENCH HOES
1¼ to 6 YDS.	25 to 125 TONS	1¼ to 7 YDS.	1¼ to 3 YDS.

. . . for more details, write No. 18 on Reader Service Postcard

Copter does construction chores on Alaska mountain

Manson-Osberg uses whirlybird to transport men and fuel on pioneer road job, and carry floor panels to isolated building site.

A FLOOR PANEL, weighing 800 lb., is carried aloft by a Hiller helicopter. The panel is enroute to the top of a 2,500-ft. mountain to be used in construction of a temporary camp.

ALASKA, with its rough terrain and isolated construction sites, represents a particular opportunity for using the versatile helicopter to move men and supplies. As transportation difficulties increase so do the economic advantages of the helicopter multiply.

Manson-Osberg Co., Seattle, demonstrated this procedure and these advantages to an unusual degree in their contract for construction of a communication station for the U. S. Air Force on top of a remote 2,500-ft. peak at a Duncan Canal site. The contract carried out under the supervision of the Corps of Engineers included the construction of 6½ mi. of access road up the precipitous side of the mountain to the building site. With a construction schedule providing only 7 months, the contractor used the services of Temsco Copters, Inc., of Ketchikan, and its Hiller 12-E helicopter.

Key to success in meeting this tight schedule was to push a temporary road up the mountain so that the actual building construction at the site could get under way in time to meet the completion date. With snows and subzero temperatures, common as early as October, speed was vitally important on the access road. It was during this early phase of the construction job that the helicopter demonstrated its worth.

As soon as the tote road pushed away from the home base up the mountain, the whirlybird was used to transport equipment operators and the clearing crew. Other transportation was almost impossible and if the men had walked to the equipment location, it would have represented an hour and a half each way on much of the job. The helicopter delivered men in these crews to the working sites in trips averaging 4 min. Of equal importance to handling personnel was the use of the helicopter to deliver a supply of diesel fuel to the dozers. This was carried out by tying barrels of fuel to the end of a 100-ft. rope provided with a special cargo hitch that was released while hovering over an open spot near each piece of equipment.

Landing fields—if that is the proper term—were no particular problem to the highly maneuverable Hiller 12-E. At many locations on the mountain side, there were patches of grassy overburden typical of the country in southeastern Alaska. These provided ready-made clearings adequate for helicopter service. Some of these were not over 50 ft. across, but the copter seemed to have no difficulty in getting in or out. If it was necessary to "build" a heliport, loggers were able to accomplish the job in a matter of minutes by cutting down a few trees and clearing a small area.

As is generally true, once a helicopter begins its service on a construction job, more and more uses are found for it. On the Manson-Osberg job, for instance, the problem of supplying the temporary campsite with water found a quick solution with the whirlybird. More than 5,000 ft. of pipe were strung to the nearest source of water by flying sections to convenient points along the route. A crew was able to connect up the line with minimum amount of time.

Superintendent Wayne Stowe of the contracting organization stated that use of the helicopter for this particular operation cut in half the

(Continued on page 56)

PRACTICALLY ALL of the material for a second camp on top of a mountain at Duncan Canal, Alaska, was flown to the site by a helicopter. Manson-Osberg workmen are shown here assembling prefabricated panels with some of the winter's snow still in the foreground.

That asphalt specification maze!

By E. J. WOODWARD, Jr.
Vice-President
Industrial Asphalt of California, Inc.

SPECIFICATIONS to the right, specifications to the left, and specifications to the front, but into the Valley of Specifications charge the contractors. It may not seem as bad as it is, but to the contractor or commercial asphalt producers the number of different specifications that they must work by is appalling.

We all recognize the need for different specifications in certain areas because of the material problem or some local situation. These specifications are very important for they give the locality the most economical and practical material from the sources available. The type and nature of rock and sand is very important to writing specifications and in many instances more thought should be given to this problem.

The different materials are not the main cause of the numerous specifications, for simple changes in a few specifications to meet local rock and sand sources could solve this problem. The main problem of so many kinds of specifications seems to stem from two sources; (1) individuality and preference; (2) terminology of names and mixes.

Let us take a closer look at these:

Individuality and Preference—Experience is the best teacher and especially in the field of asphaltic paving for we continually gain knowledge in this field. When a person has tried different mixes of asphaltic paving materials for years he forms an opinion of what mix does the best job for him. In light of this fact he sets up specifications to suit his needs.

The specification writer or engineer in the next locality has had similar experiences and he sets up specifications to suit his needs. Although each is correct in relying on his experience, you can quickly see how the individual creates a specification to solve his own problem. Multiply this by individuals, localities, cities, counties, state, Federal Government, U. S. Navy, Corps of Engineers, and you can see how enormous the pile of specifications can become.

Terminology of Names and Mixes—The individual is again the important factor when he develops names such as Topeka, Medium Topeka, Fine Topeka, and many other names. When material is called for as Topeka it is different in each area. So specifications are set up in each area to make the kind of Topeka to fill each individual need. The use of names for mixes has tried to follow asphalt paving materials from area to area without much success because of the difference in rock and sand materials available. Individual likes and dislikes add to an already complicated problem.

We of Industrial Asphalt have started in the direction of setting up a recommended design and specifications for commercial asphalt paving that fits the general materials in all areas. Such standard specifications give the contractor the opportunity to order and receive the same basic material no matter which of our plants it is ordered from. These specifications are set up by gradation and the Marshall Method of testing to produce the best possible commercial material economically. Thousands of tests have been run with the gradation shown in the accompanying table.

(Continued on page 56)

FIVE MIXES THAT BRING STANDARDDIZATION TO INDUSTRIAL ASPHALT

Sieve Size	*Industrial A*	*Industrial B*	*Industrial C*	*Industrial D*	*Industrial E*
1½	100				
1	90-100	100			
¾	-	95-100	100		
½	60-80	-	90-100	100	100
⅜	-	65-80	70-85	80-95	95-100
4	32-43	45-60	50-65	55-75	65-85
8	26-36	30-45	35-50	38-55	47-65
30	15-25	18-30	19-30	20-30	21-33
200	0-5	2-6	2-7	2-8	2-9
Marshall Stability Min.	1200	1100	800	700	600

Recommended for:

A—First course for warehouse floors, loading docks or other very-heavy-duty uses.

B—First or second course for heavy-duty commercial parking areas, driveways, alleyways and resurfacing.

C—Commercial parking, service stations, and resurfacing. Also may be used as a second course for heavy-duty commercial parking areas, driveways and alleyways.

D—Light parking, walkways, residential driveways and resurfacing.

E—Schoolgrounds, playfields, playcourts, and resurfacing.

Facts on Ryerson post-tensioning fo

A service that features simplicity and reliability ...assures lower cost per pound of steel

Prestressed concrete has literally exploded onto the construction scene in the past few years—and has established itself as a vital factor in the building industry.

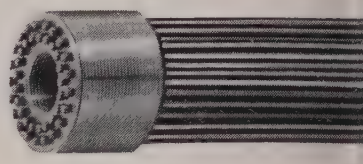
Setting the pace, Ryerson's complete post-tensioning service brings new and dramatic possibilities to the field of reinforced concrete construction. Offering both lower cost and greater versatility, this service makes prestressing really practical for designers and contractors alike.

Today Ryerson post-tensioning service, using the time-proved BBRV method, is playing an important role in more and more big construction projects from coast to coast.

This unique Ryerson service covers prestressed concrete application completely, from adaption of the engineers' design through the final stages of field erection. At every step Ryerson experience is available to overcome doubt and unfamiliarity . . . Ryerson materials and equipment are available to make new techniques safe and reliable . . . Ryerson know-how is available to help get the job done. And it's all wrapped up in a complete, single-price, post-tensioning service. See details on the opposite page.

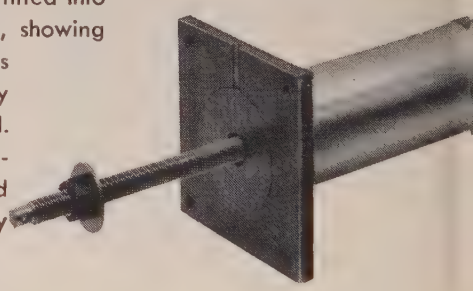
Following are some of the highlights of Ryerson post-tensioning service, showing how it offers new design freedom and economy—saving time and cutting costs. For further information on post-tensioning and the rest of Ryerson's complete service to the construction industry, call your Ryerson representative.

MOVABLE ANCHOR HEAD



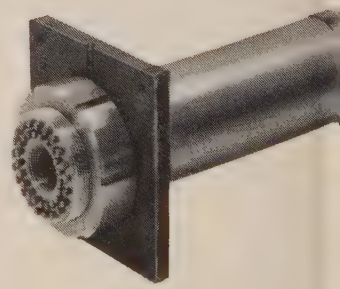
Made of high-grade steel with exterior threads for lock nut and interior threads for pull rod. Steel wires of exact length are inserted through the holes in anchor head and retained by cold forme button heads.

MOVABLE ANCHOR HEAD ASSEMBLY BEFORE STRESSING



. . . with wire bundle fitted into trumpet and conduit, showing the device which is used to temporarily hold the anchor head. Threaded bar on holding device can be used to secure the assembly to the formwork.

MOVABLE ANCHOR HEAD ASSEMBLY AFTER STRESSING



The movable anchor head is positively held in its final position by means of a lock nut screwed against the bearing plate. The center hole, after removal of the pull rod, is used as the grout inlet.

STRESSING DATA

(according to the Bureau of Public Roads)

Number of Wires (diam.)	1—¼"	12—¼"	24—¼"	40—¼"
Section of Wires (sq. in.)	.04909	0.589	1.178	1.963
Final Force—after losses (lb.)	7,070	85,000	170,000	283,000
Initial Force—before losses (lb.)	8,250	99,000	198,000	330,000
Overstressing Force (lb.)	9,420	113,000	226,000	377,000
Ultimate Force of Tendon (lb.)	11,780	141,380	282,760	471,260

PRESTRESSED CONCRETE

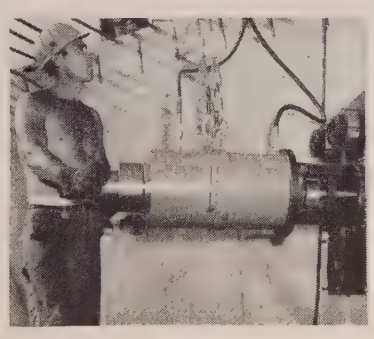
COVERS EVERY OPERATION

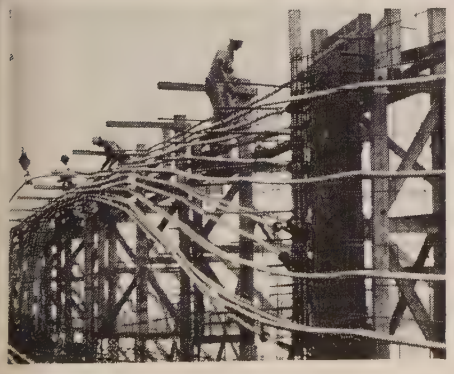
1. Force development calculations—from the design engineers' basic data Ryerson furnishes the necessary computation verifying that forces developed by our system meet all requirements of your plans and specifications.

2. Detailing and placement plans—Ryerson prepares detailed placing drawings for the tendons, grout connections, grout vent pipes, anchorages, and other components. All units are clearly tagged and identified in accordance with these drawings.

3. Quality-controlled tendon and anchorage assembly—all units are fabricated under carefully controlled conditions. We can furnish test reports on every heat of wire used in the tendon. In every processing step we maintain close quality controls that assure compliance with all your specifications.

4. Equipment for precise stressing and positive grouting—we furnish all equipment, including easily operated jacks, precise instruments for measuring stress and elongation, hydraulic pumps, drop mixers, etc.





5. Field labor procedures—experienced Ryerson personnel assist in the supervision of every step of the post-tensioning operation, from accurate placement of tendons through precision stressing and anchoring to final positive grouting.

6. Dependably scheduled deliveries—Ryerson's nationwide distribution facilities give unequaled convenience and flexibility. Materials and equipment arrive at construction site in accordance with job progress.

RECENT CONSTRUCTION PROJECTS USING RYERSON POST-TENSIONING

WANAPUM DAM DEVELOPMENT, EPHRATA, WASHINGTON
BUILDER—Public Utility District of Grant County, Washington
ENGINEER—Harza Engineering Co., Chicago
CONTRACTOR—Grant County Constructors

UNITED AIR LINES EXECUTIVE OFFICE AND TRAINING CENTER, CHICAGO
ARCHITECT—Skidmore, Owings & Merrill
CONTRACTOR—Gust K. Newberg Construction Co.

ONEIDA LAKE BRIDGE
BUILDER—State of New York, Dept. of Public Works
ENGINEER—Summers, Munninger and Molke
CONTRACTOR—Terry Contracting, Inc.

CHICAGO EXPOSITION CENTER
BUILDER—City of Chicago
CHIEF ARCHITECT—Alfred Shaw
STRUCTURAL ENGINEER—Carl Metz
CONTRACTOR—Gust K. Newberg Construction Co.

NAVAL AIR STATION TAXIWAY, LEMOORE, CALIFORNIA
BUILDER AND ENGINEER—U. S. Navy
CONTRACTOR—Griffith Company

NORTHWEST EXPRESSWAY OVERPASS, CHICAGO
BUILDER AND ENGINEER—Cook County (Illinois) Highway Dept.
CONTRACTOR—Thomas McQueen Co.

LAKE MEADOWS SKATING RINK, CHICAGO
BUILDER—New York Life Insurance Co.
ARCHITECT AND ENGINEER—Skidmore, Owings & Merrill
CONTRACTOR—Turner Construction Co.

GEORGE WASHINGTON BRIDGE APPROACHES, NEW YORK CITY
BUILDER AND ENGINEER—Port of New York Authority
GENERAL CONTRACTORS—Gull Contracting, Inc.; Johnson, Drake & Piper
SUB-CONTRACTOR—Precrete, Inc.

MISSION VALLEY FREEWAY BRIDGES AND PRESIDIO PARK OVERPASS, SAN DIEGO
BUILDER AND ENGINEER—State of California, Dept. of Public Works, Div. of Highways
CONTRACTOR—W. F. Maxwell Co.

SANTA MONICA AND SANTA ANA FREEWAYS INTERCHANGE
BUILDER AND ENGINEER—State of California, Dept. of Public Works, Div. of Highways
CONTRACTOR—Peter Kiewit Sons Co.

CENTURY 21 COLISEUM, SEATTLE
BUILDER—State of Washington, Dept. of Commerce & Economic Development
ARCHITECT—Paul Thiry, Seattle
CONTRACTOR—Howard S. Wright Construction Co., Seattle

LEHIGH PORTLAND CEMENT STORAGE BUILDING, MITCHELL, INDIANA
ENGINEER AND CONSTRUCTOR—Fruin-Colnon Contracting Co.

MULTI-LEVEL PARKING DECK, HAMMOND, INDIANA
BUILDER—Triangle Parking Corp., Hammond
ENGINEER—DeLeuw, Cather & Co., Chicago
CONTRACTOR—Roy C. Clark, Inc., East Chicago, Indiana

ROOF STRUCTURES, CONEY ISLAND POLLUTION CONTROL PROJECT
BUILDER—City of New York, Dept. of Public Works
ENGINEER—Greeley & Hansen, Chicago
Consultant—Frank Klein, Chicago
CONTRACTOR—Lasker-Goldman Corp., New York City

GRINNELL COLLEGE FINE ARTS CENTER, GRINNELL, IOWA
ARCHITECT—Skidmore, Owings & Merrill
CONTRACTOR—The Weitz Company, Inc., Des Moines

OTHER RYERSON CONSTRUCTION PRODUCTS

Re-bars, spirals, wire fabric, sheet steel piling • Open-web joists • Caisson rings • Structural shapes • Structural and aluminum tubing • Grating • Stair treads • Threaded bars • Crex and Lally columns • Aluminum building products • PVC waterstops, expansion joints, conduits, etc.

RYERSON STEEL®

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PLANT SERVICE CENTERS: BOSTON • BUFFALO • CHARLOTTE • CHICAGO
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ST. LOUIS • SAN FRANCISCO • SEATTLE • SPOKANE • WALLINGFORD

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ASPHALT

(Continued from page 53)

By combining these mixes with the proper grade of asphalt, they can and will give a good commercial asphaltic paving material. These mixes will eliminate the need of numerous types of Topeka and school mixes into a few uniform products. The actual minimum Marshall stability required for these mixes is about half of the actual obtained with proper quality control. Constant checking will provide this quality. Our specifications also provide a cross-section photo for each type mix design. Recommended use of each particular mix is stated in the table.

We feel that the contractor, cities, counties and any individual wants the most economical and best asphalt paving material available under normal and local material conditions. This is why we made a study of local material conditions and tried to set up over-all specifications that would fit our 35 plants. As a result we, too, have added to the many specifications that confront the contractor, but we are trying to improve the manufacture of commercial asphaltic paving materials, an area which we feel is sadly lacking in improvement to cope with today's premium liquid asphalt. You might think we produce only our own design mixes, but this is untrue for city, county, state, and federal specification mixes are produced daily.

We have tried to determine whether there is need for so many types of specifications as now exist. We feel that the answer to this question is "NO," but to solve the problem is almost an impossibility. As long as we have individuals and terminology of names, we shall have numerous specifications. To control the problem to some extent, we feel that a few steps can be taken:

(1) Study the individual location and materials available in the area. Talk to local producers, and set up mix designs that are both economical and will give good service. Your state specifications might be your answer, but they cover the whole state and not your local county or area.

(2) Try to weed out individual preferences of mixes that are a few pounds different from some other mix. Everyone wants his individual mix, but with a little compromising, you might get 20 mixes to fit one specification.

(3) You will always have those from the "old school," and they must be given their due for they learned the hard way. But progress is being made in the asphalt paving design field and the present day ⅜-in. mix could replace most of the need for ½-in. mix, or vice versa.

So look at the economics and the materials available in your local area and with these in mind give and take a little to insure a good job at reasonable cost. If you are able to do this you can group your localities or cities together in one common specification and all will benefit from the startling results of economy.

'COPTER

(Continued from page 52)

time required for laying the pipeline.

At the next stage of the project, the helicopter began to demonstrate its usefulness to a further degree. As soon as snows were melted from the top of the mountain, it was possible to begin work on the structures at the actual site. The 'copter under the guidance of veteran pilot Bob Young again proved its resourcefulness and time-cutting service of flying equipment directly to the building site. Included in this conveying system was a compressor weighing about 2,500 lb. which was dismantled and flown to the mountain site.

Superintendent Stowe was convinced that the job and its tight time schedule were virtually impossible without the extensive use made of the helicopter. In addition to moving crews and materials, it was a particular help to him and other members of the supervisory staff in visiting scattered locations with a minimum of delay.

The particular helicopter used on this site (Hiller 12-E) was selected because of the small areas of the landing spots that would be available, with extreme maneuverability of the 'copter as an important consideration. This machine which weighs about 1,700 lb. empty is able to transport a useful load of about 1,000 lb. This was demonstrated on the job when floor panels were airlifted to the top of the mountain (see picture). These floor panels weighed nearly 1,000 lb., as did some other preassembled units which were moved to a temporary camp.

NICASIO

(Continued from page 46)

Compaction of the embankment and the roadbed is handled by a Caterpillar DW20 tractor equipped with Hyster plate roll wheels, as well as by conventional sheepsfoot rollers towed in pairs.

Maintenance

The highball schedule of the job took its toll in tires particularly at the start of the job when equipment was rushed in from other locations without the standard end-of-job overhaul. Scrapers, including the twin-engine spread, were loaded out-of-gear to minimize tire wear. Tire service on the job is under contract to Gallaway Sales & Service, Inc. The firm maintains a truck and service man on the job full-time. Tire maintenance program includes daily inspection and pressure check and replacement and recapping of worn tires as needed. Gallaway also maintains a warehouse stock of contractors supplies, tools and equipment covering everything but major equipment components at the job. Contractor draws from these stocks as they are needed and is billed only for what he uses.

Preventive maintenance of equipment centers around dust protection. Earl Froscher, master mechanic, said oil in air cleaners is changed every day; while dry-type air cleaners are blown out every other evening. Fuel filters are changed once a week and oil filters changed at every oil change.

Personnel

Marin Municipal Water District staff includes Wm. R. Seegar, chief engineer; Rudy Smith, resident engineer; and Bill Grant, project manager. The contractor's key men are Russell Hopkins, project manager; Charles Stierwalt, concrete and structures superintendent; Don Smith, project engineer; Earl Froscher, master mechanic; Floyd Wine and Bill Blair, grade foremen; Boyd Clay, jobsite accountant; and Ed Davis, drill foreman.

Principal subcontractors are: Paving — E. A. Forde Co., Corte Madera, Calif.; drill and grout — L. L. Jeffries, Richmond, Calif.; guard rail — Wolfert Co., San Leandro, Calif.; bridge — Henry Bormolini, Novata, Calif.; re-steel—San Jose Steel Co., San Jose, Calif.

Now! A complete line of ATLAS COPCO rock drills with the original "Autoleg"!

TIGER
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fastest hitting in the line. Ideal for stoping and development work!

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general-purpose drill for fast, easy drilling in all types of rock!

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BBC 22

fast, dependable machine for "highballing", long hole drilling and tunneling!

ATLAS COPCO'S TIGER, PUMA, LION have all controls under one hand, automatic water flushing and original "Autoleg" that retracts automatically increasing footage per man-shift!

Comparison of the Tiger, Puma and Lion

	TIGER BBD 50	PUMA BBC 15	LION BBC 22
Weight (lbs)	60	55	65
Weight w/pusher	94	89	99
Blows/min.	3050	2300	2000
Bore ins	3	2 3/4	2 3/4
Stroke ins	1 3/4	2 5/32	2 3/4

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WESTERN CONSTRUCTION NEWS

Trinity Dam fill topped at 537 ft.

TRINITY DAM has reached its ultimate 537-ft. structural height, making it the highest earthfill dam in the world. It will create a major storage reservoir on the Trinity River. The Trinity River Division of the Central Valley Project was recommended by President Eisenhower and authorized by Congress in 1955.

Trinity Dam contractors, with their large fleets of earth-moving equipment, have completed the placement of 33,000,000 cu. yd. of earth and rock after working for a 3½-year period, since April 1957. They completed the earthwork about six months in advance of the expected construction time.

The carefully selected and processed material was moved into place by 140 pieces of earth-moving equipment and a 2.8-mi. conveyor belt. The scientifically compacted structure forms an impervious barrier which will create a sprawling mountainous lake of 2,500,000 ac. ft.

The contractors reached a peak employment of 1,100 skilled operators and supervisory personnel, and initially invested over $4,000,000 to set up the plant equipment and camps for constructing the dam. Their total construction contract was approximately $49,000,000.

Construction on other features of the $257,000,000 Trinity River Division is continuing. The Clear Creek tunnel, one of two major tunnels that will carry water through the mountains from the Trinity River to the Sacramento River Basin, was holed through in July 1960. Work is in progress on Spring Creek tunnel, the Whiskeytown Dam, and two of the three major power plants.

Storage of water behind Trinity Dam will begin this fall, as soon as the inflow into the reservoir exceeds the required releases to protect fish life and meet other water commitments along Trinity River. The lake will fill in two or three years, if normal run-off occurs. Trinity Lake will be the second largest storage reservoir in California, being exceeded only by Shasta Lake.

Trinity Division waters, when combined with the Sacramento River, will be used to provide irrigation service to lands in the Sacramento and San Joaquin valleys.

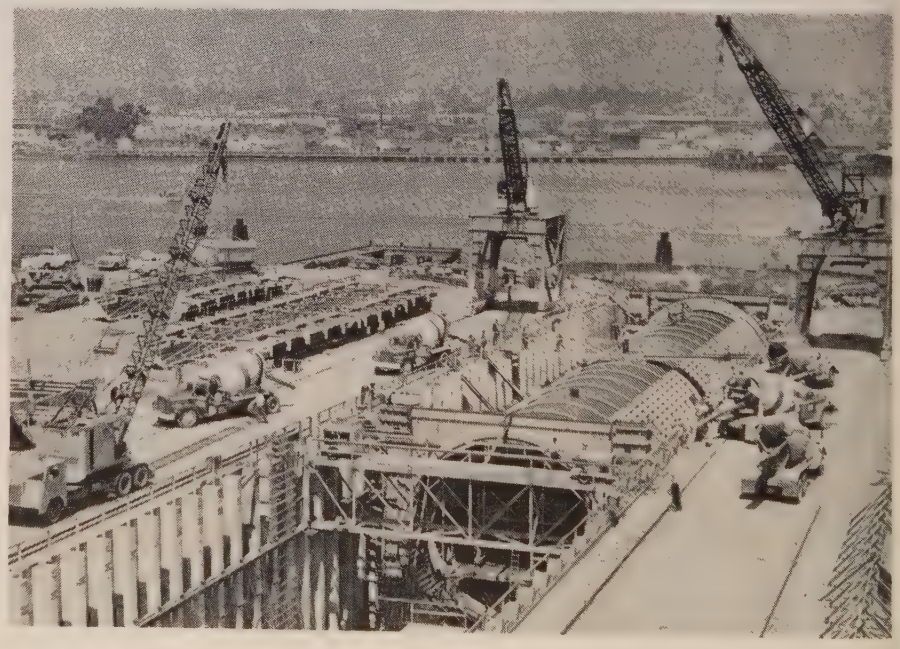
Colorado contractors agree to call for air-entraining

THE Colorado Concrete Contractors Association in a major policy decision has agreed all members would recommend air-entrained concrete for all outside flat work.

Members of the association made the decision after hearing a discussion of air-entrainment of concrete by Field Engineer Irvin Rasmusson, of the Portland Cement Association.

The contractors voted unanimously to specify concrete with an air-entraining agent sufficient to entrain at least 4½% of air by volume for all outdoor work. The action was in accord with the principles of the association to provide best concrete work for the benefit of the public.

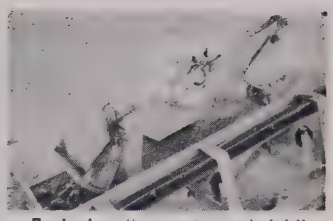
President Richard M. Russell said: "We are convinced that air-entrained concrete, when properly mixed, placed and cured, has a high resistance to the action of freezing and thawing and is not af-



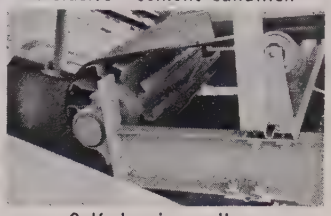
FIRST 200-FT. SECTION CAST FOR ESTUARY TUBE

The first of the 12 massive 5,500-ton precast concrete sections for the $16,641,000 Webster Street Tube between Alameda and Oakland has been completed. (See *Western Construction*, April 1960, for review of the project.) The section is 37 ft. in outside diameter and 2½ ft. thick. Contract is held by the joint venture firm of Pomeroy-Bates & Rogers—Gerwick, constructors for the California Division of Highways.

The initial step comprised casting the bottom of the tube section, and required 850 cu. yd. of concrete. The second step provided a 200-ft. section of flat reinforced concrete roadway slab, 1 ft. thick and 24 ft. wide, cast integral with the upper edges of the bottom. Third and last step involved casting the remainder of the cylindrical section, also permanently integral with the bottom and roadway slab. Each section requires 2,900 cu. yd. of concrete and 300 tons of reinforcing.



Exclusive "cement sandwich"



Self-cleaning pulleys

Tows behind any truck

ONLY A TOWBATCHER CAN DO YOUR JOB SO WELL!

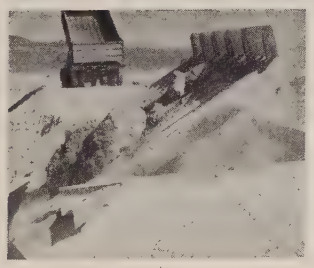
THE RUGGEDLY BUILT SIERRA TOWBATCHER GOES ANYWHERE, BEHIND ANY TRUCK AND SETS UP IN ONLY 30 MINUTES USING A FRONT END LOADER!

This remarkable portable batch plant gives you a normal capacity of 50 yards per hour, day after day, using a crew of only three men! The Towbatcher has many exclusive features such as the "cement sandwich" system which automatically places the cement between layers of aggregate on the conveyor belt. 45° troughing idlers form the belt for faster feeding of material into the mixer. Self-cleaning head and tail pulleys add to the life of the conveyor belt. Operating controls are conveniently grouped and the high visibility dial scale can easily be read at all times by the loader operator. You can select either gasoline or electric motor drive.

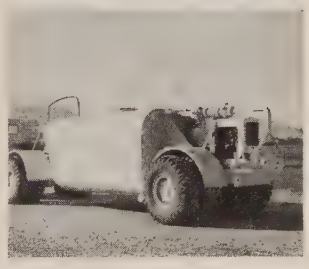
For fast, reliable concrete batching facilities, on the job, the Sierra Towbatcher is the right piece of equipment for you! See your dealer or write now for full details plus illustrated material.

OTHER SIERRA ENGINEERING PRODUCTS . . .

SIERRA TOW SILO: 330 barrel capacity horizontal model with gasoline or electric motor drive.



SIERRA GRIZZLY: 12′x12′ drive-over grizzly handles up to 27 yard hauling units. Hydraulic lift disposes of oversize material.



SIERRA TOW TANK: 6,000 gallon water wagon designed for off-highway use. Has 2 sets of 9 adjustable nozzles equipped with 6″ water pump.

SIERRA PIT LOADER: Large capacity loading conveyor for materials from fine to 20″ minus. Portable with exclusive "duo-belt" feature for longer belt life. Sizes from 36″ to 72″ belt.

SIERRA ENGINEERING CO. INC.

307 Morrill Avenue, Reno, Nevada

DEALERS: ARIZONA—Phoenix: Min-a-con Equipment Co. **CALIFORNIA**—Bakersfield: Inland Equipment Co.; El Cajon: K.C.Y. Tractor Co.; Sacramento: Rix Central Equipment Co; San Francisco: Rix Central Equipment Co. **COLORADO**—Denver: Colorado Builders Supply Co. **IDAHO**—Boise: Intermountain Equipment Co.; Idaho Falls: Western Machinery Co. **MONTANA**—Butte: Hall-Perry Machinery Co.; Great Falls: Hall-Perry Machinery Co.; Helena: Hall-Perry Machinery Co. **OREGON**—Portland: Balzer Machinery Co. **UTAH**—Salt Lake City: Western Machinery Co. **WASHINGTON**—Seattle: Sahlberg Equipment Co.

. . . for more details, write No. 21 on Reader Service Postcard

fected by the use of salt and other de-icing chemicals. As concrete contractors interested in doing the best job possible, it is almost mandatory that we provide the best possible concrete, and the best concrete for outdoor work obviously is air-entrained concrete."

Low flow in Colorado River drops Hoover power output

A decision to reduce water releases through the turbines at Hoover Dam during the remainder of the current power year ending next May 31 has been announced.

The generation schedule for the Hoover Powerplant was set at approximately 91% of firm. The reduction resulted from below-average run-off on the Colorado River during the spring and summer. This decision came as a follow-up of a similar decision here last June 15 in which the Hoover power generation schedule was set at 100% firm.

The April-July Colorado River inflow to Lake Mead this year was 6,120,000 ac. ft. or 73% of the 37-year average.

After reaching a low last March 11 of 1,163.0 ft. above sea level, Lake Mead climbed to a year's high on July 5-6 of 1,184.2 ft., a rise of over 22 ft. By September 15, the reservoir had dropped about 11 ft.

AASHO endorses program for public information

THE American Association of State Highway Officials has endorsed the general objectives of the "good roads" campaign now being developed by the Better Highways Information Foundation. The Executive Committee of AASHO has called on individual state highway departments to cooperate with the roadbuilding industry's public service educational program.

The Foundation's objective is to disseminate information about the need for and benefits from modern highways and so to build a reservoir of public understanding and good will for the national highway program. The program is being carried on nationally by BHIF and at the state level by various state groups. AASHO urged its members to assist the movement along sound lines by furnishing reliable factual material, photographs and any data that might help lead the citizens of a state to a better understanding of their highway needs.

"We are in high hopes that through the activities of the Foundation the public will receive a better understanding of highway needs. We certainly need that sort of effort," said David H. Stevens, president of AASHO.

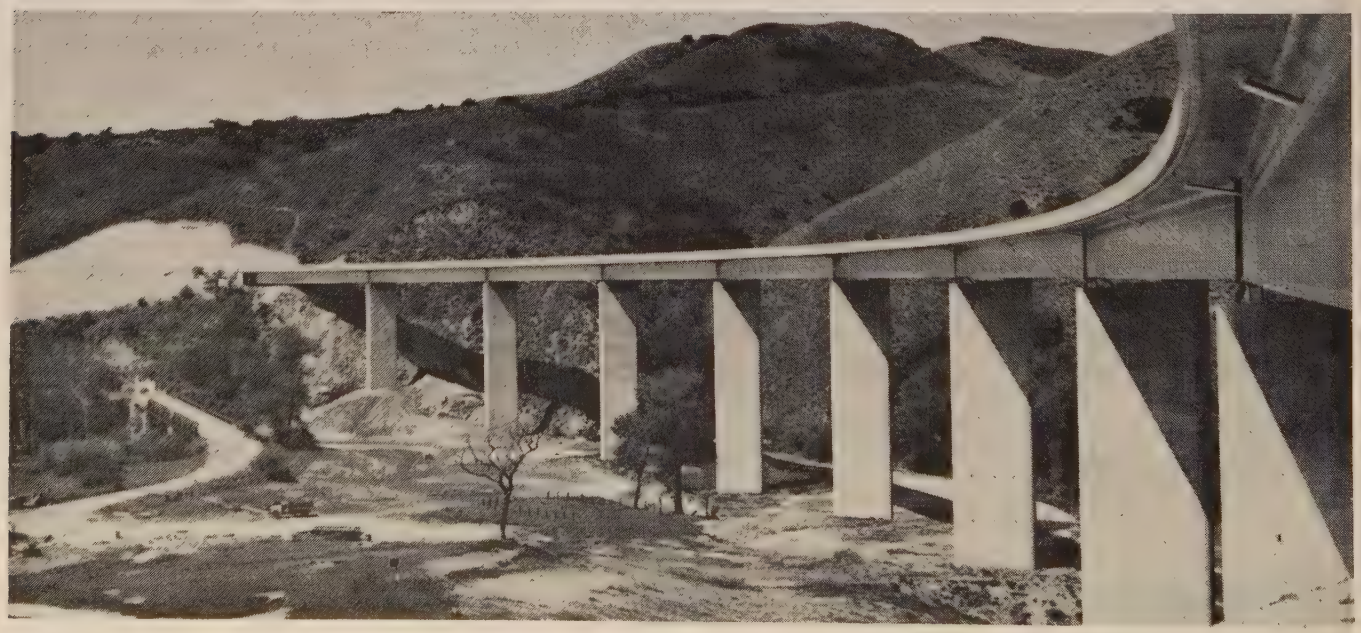
Commenting on the AASHO action, H. D. Anderson, vice chairman of BHIF, said:

"We are indeed gratified to receive this recognition and offer of cooperation. In some states, the state highway department is carrying on an excellent public information program. In others, the departments are precluded from doing so by policy, staff or budget limitations. Here, the industry's public service program can work to mutual advantage of both parties. We have identical goals. We are delighted to hear of the AASHO recommendation."

Permanente Cement to build Alaskan plant

PERMANENTE Cement Company has filed claims covering 240 acres of high-grade limestone deposits near Anchorage, Alaska. The limestone deposits will serve as sources of raw material for a cement manufacturing plant which Permanente plans to build to serve Alaska's growing construction market. A site has been acquired at Sutton, adjacent to the Alaska Railroad line, where the plant will be located.

The limestone deposits are located in the Upper King's River Valley. Filing of the claims follows extensive study and search by Permanente for such strategically located reserves.



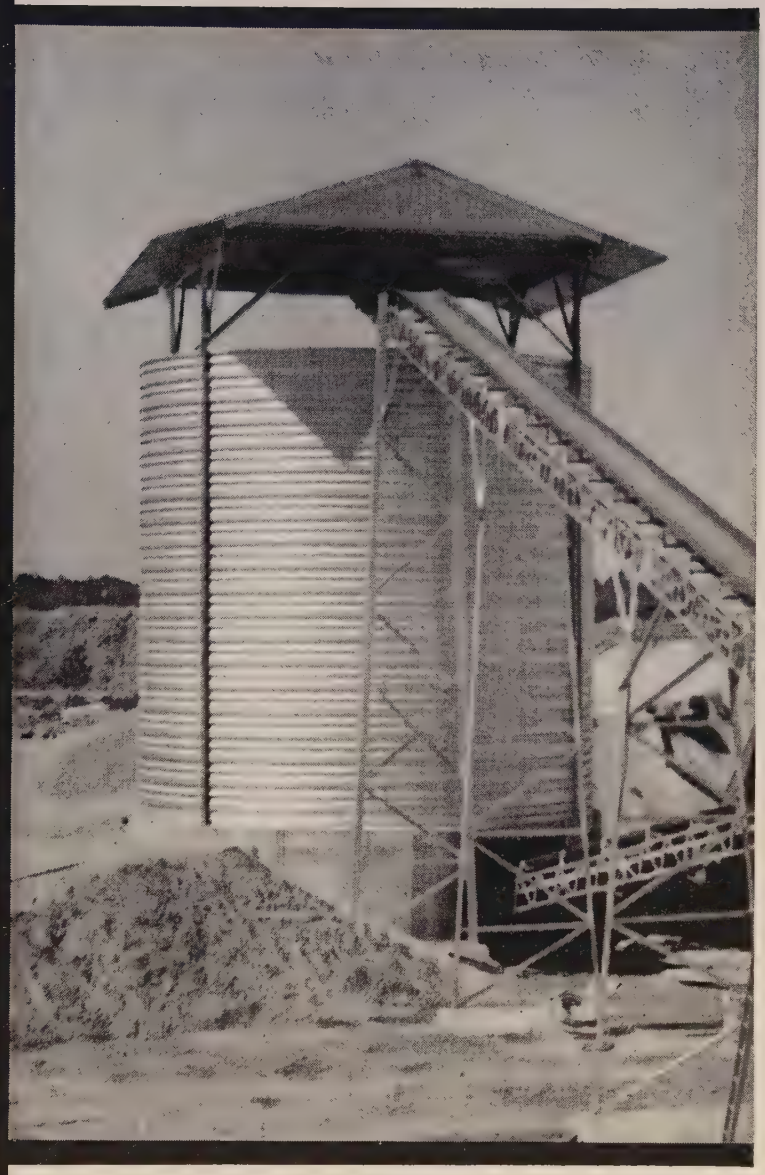
THREE CALIFORNIA BRIDGES WIN AWARDS IN AISC ANNUAL NATIONAL CONTEST

This bridge across the Huasna River, 10 mi. north of Santa Maria, Calif., was chosen top award winner in Class II—bridges for fixed spans under 400 ft. and costing more than $500,000—in the annual Aesthetic Prize Bridge Competition sponsored by the American Institute of Steel Construction. Designed by the California Division of Highways, the bridge was fabricated by Vinnell Steel, Irwindale, Calif.

In the same classification, honorable mentions were received by two other California structures: the Robert R. Shoemaker Bridge at Long Beach, and the Truckee River bridge.

Armco Liner Plates Make Rugged Aggregate Bin

New steels are born at Armco



Armco Liner Plates were used in constructing this aggregate bin for the Falls City Stone Company of Fern Creek, Kentucky. The bin, serving as storage between primary and secondary crushing plants during breakdown, is 30 feet high, 360 feet in diameter and is built of 3-gage circular plates.

Lightweight and easy to erect, Armco Liner Plates are made in material thicknesses from 14 through 3 gage. This wide range means you buy no more steel than is needed to carry a particular load.

Roof over the bin, 24 feet wide and 34 feet long, is made of interlocking Armco STEELOX® panels.

Armco Liner Plates are also used by contractors to install conduits, drainage structures, and underpasses under railroads, highways, and streets. For complete information, call or write us. Armco Drainage & Metal Products, Inc., 2180 Milvia St., Berkeley 4, Calif., P.O. Box 751, Federal Station, Portland 7, Oregon.

Steel

ARMCO DRAINAGE & METAL PRODUCTS

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ALASKA Newsletter

By CLIFFORD S. CERNICK, Fairbanks

TERMINATION DUST AGAIN—Overnight, Alaska's hills have turned from autumn yellow to winter white. As this is being written, "termination dust" — the first snowfall of winter — is falling and the southbound jet planes are packed with home-going construction workers. With the Alaskan winter upon us, and many of the big jobs either slowing down or closed down, it's time for a look back at the 1960 construction season. In the next column, we'll take a careful look ahead.

RESULTS AND REGRETS — In general, it has been a year of results — and some regrets. In general, defense construction moved along at a heartening clip. A massive effort—probably the greatest Alaska has ever seen—brought the Clear Ballistic Missile Early Warning Station a giant stride toward completion. Defense housing, communications — all moved forward at a very rapid clip. But the road program, which held out so much hope of dominating the 1960 construction effort, fizzled badly. As far as road building is concerned, progress was slow, results meager and regrets widespread.

MANY DEVELOPMENTS — The 1960 construction season saw many vital developments in Alaska. A $5 million gas line was constructed from the Kenai Peninsula to Anchorage. A new university opened its doors in Anchorage, springing up out of the moose pastures at the fringe of the city. In the same area, a new mental hospital and a new general hospital are going up. More than a dozen new commercial buildings sprouted in the downtown Anchorage area. In Fairbanks, commercial construction moved ahead rapidly; a $2 million shopping center opened its doors, bringing the innovation of circular, coliseum-like construction to Alaska. Work started on a new circular school and was completed on another school of conventional type. More than 100 homes went up throughout the Greater Fairbanks area; in Anchorage, at least double that number were constructed.

It was a good construction year—a year that gave jobs to a record number of workers and brought contract totals to a new high. One of the facets of this construction season was the fact that wages were high and the salaries earned during the season by common laborers and skilled trades alike reached astonishing totals. One construction worker told me in September that he had earned $10,000 since May and was quitting because "the way tax rates are now, it costs you more to be employed than unemployed." Weekly paychecks of $200, $300 and $400 were more the rule than the exception. For literally hundreds of construction men, it was a lucrative year — strike-free and blessed with plenty of work.

HIGHWAY TROUBLES — The biggest single setback in the 1960 Alaska construction program came in the category of roads. It was a year which saw the State Division of Highways assume the major responsibility for road building in Alaska. The transition from the Federal Bureau of Public Roads to state operation came in July—a month which many considered ill-advised since the change was accomplished at the peak of the season. The state had to start from scratch. Personnel, especially highly-skilled engineering personnel, proved hard to get. There were innumerable problems of organization and supply — some of them proved far tougher than had been anticipated. Though more than $35 million was available for road work, less than half of that amount actually was sifted through the construction hopper. Many contracts, which had been scheduled for bidding in the spring and summer of 1960, still remained "untouched" by the fall of the year.

The state blamed unforeseen transitional difficulties for the delays. Politicians, seizing the opportunity to make political capital of the lagging road program, placed the blame elsewhere. In October, in the weeks just before election, Alaska roads have become a prime campaign issue. There were signs that the worst was over and that 1961 would fulfill the promises of 1960. Problems of personnel, organization and planning have been resolved. But this fall Alaskans could see only the reality of a road construction program that came nowhere near the expectations which blossomed last spring.

RIFT DENIED—One of the most newsworthy construction industry events of the summer was the disclosure of charges that there was growing disharmony and even bitterness standing in the way of cooperation on the road program by the state and federal road agencies in Alaska. The charges were leveled in a letter written by T. D. Sherard, division chief for the state, to State Senator Edmund Orbeck. Sherard's letter criticized the Bureau of Public Roads in several areas including matters of personnel, policy, handling of right-of-way problems and the BPR's alleged failure to cooperate with the state during the transitional period. Alaska's Sen. Ernest Gruening turned Orbeck's letter over to Ellis L. Armstrong, U. S. Commissioner, Bureau of Public Roads, when Armstrong visited Fairbanks on a routine trip to the 49th state. Armstrong declared he was upset by the charges of disharmony and later took up the entire matter with Gov. William A. Egan, Public Works Commissioner Richard Downing and Sherard himself.

Following this meeting, a press release was issued in which both sides to the controversy were quoted as pledging the fullest cooperation in the road construction effort. But Armstrong did not leave Alaska before stating that he felt the takeover of the highway functions by the state was poorly timed. Armstrong pointed out in Fairbanks that the state had five years in which to make the transition and could have saved itself a great deal of trouble by timing the changeover more carefully.

INDIAN MOUNTAIN SHUTDOWN—Winter weather brought work at the Indian Mountain Air

Grouped around the master blueprint for the pier project, left to right, are C.I.T. representative Hud Connery, Frank Martz, job superintendent and Gil Wyner, president of Gil Wyner Company.

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Force Station to a complete halt for the season. Snow started to drift across the jobsite in late September. Peter Kiewit Sons' Co. of Seattle holds a $2,500,000 contract for the work, which includes construction of a composite building for housing and a radar tower.

PIPELINE DEDICATED—Continuous flow of oil from Kenai Peninsula oil wells has started through a 22-mi. pipeline from the peninsula's interior to the port of Nikiski. The pipeline was built by the Kenai pipeline company, a subsidiary of Standard Oil Co. of Calif. The Nikiski dock has been designed to handle tankers up to 28,000 deadweight tons. The two 132,000 barrel storage tanks at the terminal will hold enough oil to load three tankers.

CONSTRUCTION NEWS NUGGETS—Alaska's first chain store, the Woolworth store in Anchorage, will open in November. Two chain stores will be built in Fairbanks in 1961—Woolworth and Safeway . . . A helicopter was used with great success in survey and inspection of the Kenai Peninsula-Anchorage natural gas line when it was under construction this summer . . . The Army Port of Whittier, which has two large "skyscraper" buildings, is being placed in mothballs and the military is entertaining several suggestions for use of the buildings both from private and state sources . . . Completion of a new Anchorage-Fairbanks road which will, for the most part, parallel the Alaska Railroad, will take approximately five more years. Work is now proceeding on both ends of this proposed highway route; from Fairbanks toward McKinley Park and from Anchorage in the direction of Talkeetna . . . Agitation in Anchorage to move the capital of Alaska to a more central location will be continued according to reports reaching here and will be intensified when the next state legislature goes into session . . . Passage of a bond issue on the state election ballot in the current Alaska elections would mean construction of a large new gymnasium on the University of Alaska campus . . . Trans-Alaska Telephone Co. is reported by the Anchorage newspapers to be very much interested in the purchase of the Anchorage municipal phone system.

HAWAII Report

By ALAN GOODFADER, Honolulu

BIGGEST EVER—Morrison-Knudsen was low bidder here recently on the largest Federal-air highway contract ever offered in Hawaii, when it made a $3,369,257 offer on a major segment of Honolulu's Lunalilo Freeway project. The contract is for a 3-level interchange and 1.2 mi. of arterial highway. Other bidders were James W. Glover, Ltd., and Hawaiian Dredging & Construction Co.

LITTLE LULL—For the first time in months, construction employment as reported by the State Labor Department showed a drop in August. The department estimated 16,460 employed in the building trades during the month, compared to 16,660 the month before. The department estimated this was due to a slight drop in industrial building. The figure is still well above the 14,880 employed state-wide in construction in August 1959, however. From all indications, the drop doesn't mean any appreciable slackening now of construction activities here. The Honolulu Department of Buildings reported that 1,180 building permits for construction with an estimated value of $13,386,497 were issued in August, compared to 1,280 permits with an estimated value of $12,884,920 in the previous month, and 967 permits with an estimated value of $7,052,965 in August 1959. To August this year, the city has issued permits for $119,874,730 worth of civilian construction, compared to $78,458,105 in 1959.

MORE COMING?—Meanwhile, the Bank of Hawaii wants it clearly understood that its warnings of a slowdown don't mean the industry is headed for the doldrums. "Far from implying a recession or an 'economic bust,' our view is there will be a continuing growth, but that it will be in line with a long range growth rate of the economy. This, in itself, is substantial," the bank says. The bank issued its statement to correct what it said was "misinterpretation" of economic forecasts issued in New York City in August. Its bulletin of economic activities in Hawaii, which carried the statement, also noted that construction bid openings of $20,300,000 in July here were a rise of 79.8% over July 1959, and that the July openings brought the year's total to $177,500,000, compared to $109,800,000 in the same period a year ago. It also notes that $24,400,000 worth of construction was completed in the state during the first half of the year, a 26.1% increase over 1959.

INDUSTRY SIGNS—The General Contractors Association of Hawaii and the Honolulu Construction Trades Council, AFL-CIO, recently signed the first "industry-wide" contract in Hawaii's history. The pact calls for 1-cent-an-hour boosts every six months for four basic crafts and other benefits for three years. Carpenters now get $3.20 an hour, operating engineers $2.30 to $3.50, cement masons $3.20 and laborers $2.20 to $2.50. The signing came as reports were being made of a possibility the ILWU will seek to move into the construction field on Oahu, long an AFL-CIO stronghold. An independent carpenters' union is reported dickering with the ILWU for affiliation.

SLUM CLEARANCE GOES BIG—Six combines have bid for the right to buy 8.3 ac. of cleared downtown land and build a multi-million-dollar 600-unit apartment complex, as Honolulu's first large urban redevelopment project gets under way. The Honolulu Redevelopment Agency had the bids under consideration at this writing. The combines and their offers for the land are Nuuanu Redevelopment Corp., mainland and local interests, $1,174,700; Queen Emma Gardens, E. E. Black and Castle & Cooke, $1,175,000; Queen Emma Associates, combined mainland and local interests, James Wong and Milton Gordon & Associates, $1,265,043; Alexander Young, Pacific Construction, Von Hamm-Young and Associates, $1,427,692; Hung Wo Ching and other local interests, $1,175,000, and Masao Shintani, Harold Spector and other local interests, $1,750,031. While pondering the bids, the redevolpment agency is moving to start another project. It has approved filing of an application for

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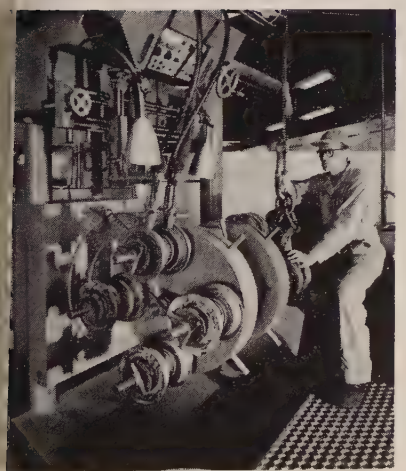

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a $2,072,625 Federal grant to finance a 4-acre slum clearance project in the heart of downtown Honolulu.

OFFICES GOING UP – Two private developers have announced plans for construction soon of major apartment buildings in Honolulu. Dr. Raymond C. Yap said his family plans to build a 30-story $10,000,000 office building – the tallest in Honolulu – on land it owns close to the mammoth Ala Moana shopping center. Developer Mitsuyuki Kido has announced he will put up a 6-story office building costing $2,000,000 on downtown King St. Also announced recently was the imminent construction of a $2,500,000 14-story co-op hotel to be built in Waikiki by the Queen Development Co. The hotel will have 210 units in three buildings.

DEFENSE PAYS OFF—Word has been received here that the Federal government has approved the first allotment for Hawaii of Defense Highway Act construction money. A total of $12,375,000 has been allotted for the start of the state's proposed $225,000,000, 50-mi. defense highway network. Dirt won't fly until January 1962, however.

OTHER PUBLIC WORKS—Other governmental public works programs are rolling. The city of Honolulu has sold $8,000,000 worth of bonds for schools, a city jail, parks, sewers, flood control, and other projects. The Soil Conservation Service and the City of Honolulu are ironing out details on a $3,449,000 watershed project to start in the rural Waianae area of Oahu next summer. The Library of Hawaii has announced it wants to build $3,383,000 worth of branch libraries on Oahu. And top local and mainland architects are vieing with one another for the job of designing Hawaii's proposed $14,000,000 capitol building. A governor's selection committee was hearing proposals as this was being written.

LOW BIDDERS – Apparent low bidders recently included: Tani Construction Co., $382,000, fourth increment, Aliamanu (Honolulu) Intermediate School; Oahu Construction Co., $598,478, Kapalama (Honolulu) Improvement District; S. Kitajima Contractor, Ltd., $206,011, Kalihi-Waena (Honolulu) 12-classroom building; Pacific Utility, $112,547, repair Hickam Air Force Base paving.

Low bids and contract awards

ALASKA

Green Construction Co., Seattle, submitted a low bid of $1,335,017 for construction of a section of the Glacier Highway from Eagle River to Yankee Cove, north of Juneau.

ARIZONA

L. M. White Contracting Co., Tucson, submitted a low bid of $1,605,216 for grading, surfacing and constructing 3 bridges on State Route 86, beginning southeast of San Simon and extending for 7 mi. to the Arizona-New Mexico State line in Cochise County. **The Ashton Co., Inc.,** Tucson, submitted a low bid of $1,500,576 for grading, draining, surfacing and constructing a steel girder bridge on the Ashfork-Flagstaff highway, U. S. 66, near Flagstaff in Coconino County. A low bid of $304,714 was submitted by **Palmer Contracting Co.** of Phoenix for grading, surfacing and related work on 5½ mi. on the Winona-Navajo Reservation line highway northwest of Winona on old U. S. Route 77, in Coconino County. **Vinnell Corp.** of Alhambra, Calif., received a $996,370 contract for the construction of the main outlet drain and Gila River pilot channel, extending from the Gila River siphon to the Colorado River, Colorado River front work and levee system, east of Yuma in Yuma County. **Royden Construction Co.,** Phoenix, submitted a low bid of $844,670 for grading, surfacing and related work on 6 mi. of the Cameron-Navajo Bridge highway north of Cameron in Coconino County. A low bid of $532,089 was submitted by **Fisher Contracting Co.,** Phoenix, for grading, surfacing and draining on 6 mi. of the Phoenix-Globe highway, U. S. Route 60, to the Maricopa-Pinal County line in Maricopa County. **Hagen Construction Co., Inc.,** Globe, submitted three low bids for roadwork in Navajo and Gila counties: $191,405 for grading, surfacing and construction of one bridge on the Holbrook-Springerville highway, southeast of Holbrook in Navajo County; $114,493 for 1.6 mi. of grading and surfacing on the Globe-Young highway, Gila County; and $94,330 for grading, widening and surfacing on the Phoenix-Globe highway in city of Globe, Gila County.

CALIFORNIA

Fredericksen & Kasler, Sacramento, received a $7,093,320 contract for construction of 13.3 mi. of 4-lane freeway on U. S. 99, south of Bakersfield in Kern County, with 15 traffic separation bridges and ramp structures; interchange and access facilities to be provided. **R. E. Hazard Contracting Co.** and **W. F. Maxwell Co.** of San Diego submitted a low bid of $5,219,340 for 1.3 mi. of grading, surfacing on 8-lane freeway together with ramps, frontage roads and 15 bridges in city of San Diego, San Diego County. **Chas. L. Harney, Inc.,** San Francisco, received a $3,921,424 contract for construction of 1.1 mi. of 6-lane freeway including bridges, overcrossing, retaining walls and storm sewer on U. S. 101 in and near San Francisco. A $2,988,425 contract was received by **V. R. Dennis Construction Co.,** San Diego, for construction of 5.4 mi. of 4-lane freeway on State Sign Route 78, near Escondido, San Diego County. A low bid of $2,635,394 was submitted by **Piombo Construction Co.,** San Carlos, for grading, surfacing and related work on 2.6 mi. of 4-lane freeway in Placerville, El Dorado County. **Clifford C. Bong & Co.,** Arcadia, received a $2,490,427 contract for construction of 3.9 mi. of 4-lane freeway bypass on U. S. 101 north of Fortuna, including 7 bridges, Humboldt County. **Gordon H. Ball,** and **Gordon H. Ball, Inc.,** Danville, received a $1,105,538 contract for constructing men's gymnasium and swimming pools at Chico State College, Butte County. **Tumblin Co.,** Bakersfield, received a $923,372 contract for construction of 2 bridges and approaches on U. S. Highway 99, Kern County. **Gallagher & Burk, Inc.,** Oakland, submitted a low bid of $773,111 for 2 mi. of grading, surfacing and constructing 2 bridges near Pleasant Hill in Contra Costa County. A low bid of $636,331 was submitted by **Raisch Construction Co.** and **Dan Caputo Co.,** San Jose, for 1.1 mi. of grading and surfacing and one bridge near San Jose Santa Clara County. **Hooker Co.** Sun Valley, submitted a low bid of $530,730 for grading and surfac

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ing on various sections near Johannesburg, San Bernardino County. **Thomas Construction Co.**, Fresno, received two contracts for roadwork in Monterey County: $511,100 for constructing a bridge over Willow Creek and approaches, south of Lucia, and $362,410 for constructing one bridge at Anderson Canyon, south of Monterey. A $339,232 contract was received by **I. L. Croft & Son, Inc., & Union Construction Co.** of Saugus for reconstructing and realigning 2.1 mi. of Carson Pass Highway, east of Picketts in Alpine County. **Cox Bros. Construction Co.**, Stanton, received a $254,130 contract for grading, surfacing and construction of foot bridge over the San Gabriel River, near Long Beach. **Baun Construction Co., Inc.**, of Fresno, submitted a low bid of $173,414 for grading and paving various sections southwest of Lemoore in Fresno and Kings counties.

COLORADO

Bud King Construction Co., Missoula, Mont., received a $1,930,779 contract for construction of Crawford Dam, Smith Fork Participating Project, Colorado River Storage Project. **J. A. Tobin Construction Co.**, Denver, received a $1,685,012 contract for grading and surfacing on 13 mi. of Interstate 6 between Hudson and Roggen in Weld County. A low bid of $851,057 was submitted by **Hubner Williams Co.**, Denver, for constructing a railroad and highway grade separation on State Highway 1 and 70 in Arapahoe County. **Northwestern Engineering Co.** of Denver received three contracts for roadwork in Kiowa, La Plata and Arapahoe counties: $241,579 for grading and surfacing on 4.5 mi. east of Eads, Kiowa County; $219,443 for grading, structures and asphaltic paving on 3.7 mi. south of Breen in La Plata County, and $108,094 for grading and surfacing on 4.4 mi. of State Highway 88, Arapahoe Road, Arapahoe County. **C. L. Hubner Co.** of Denver submitted a low bid of $642,384 for grading, structures and paving on 2.4 mi. on State Highway 6, La Junta and Otero counties. **A. S. Horner Construction Co., Inc.**, Denver, received a $427,210 contract for construction of 6 major structures on Interstate Route 80S, between Fort Morgan and Brush in Morgan County. **Pioneer Construction Co.**, Pueblo, received two contracts for highway work in Pueblo and El Paso counties: $256,363 for constructing an overpass on U. S. 85-87 at Dump road in city and county of Pueblo, and $277,581 for grading, surfacing and structures on 3.2 mi., between Penrose and Colorado Springs, El Paso County. A $239,129 contract was received by **Gardner Construction Co.**, Littleton, for structures, grading and surfacing on 4 mi. of a new alignment for Colorado 114 on the northwest side of Cochetopa Pass, Saguache County. **Siegrist Construction Co.**, Denver, received a $177,745 contract for improvement of 7 mi. of State Highway 14, from Muddy Pass northeasterly in Jackson County.

IDAHO

MacGregor Triangle Co., Boise, received a $362,188 contract for grading and surfacing on Idaho forest road. A $545,954 contract was received by **C. H. Elle Construction Co.**, Pocatello, for 8.8 mi. of grading, surfacing and constructing one bridge in Madison County.

NEVADA

Isbell Construction Co. of Reno received a $1,666,548 contract for construction of 7.9 mi. on U. S. 395 near the city of Reno in Washoe County. **Whiting Bros. Construction Co., Inc.**, Las Vegas, received a $187,937 contract for construction of a portion of highway U. S. 93 and 466 between Henderson and Boulder City in Clark County. A $155,724 contract was received by **Eckley Construction Co.** of Reno for grading and surfacing on 4 mi. northwest of Smith in Lyon County.

NEW MEXICO

C & R Paving Co., Inc., of Albuquerque, received a $369,912 contract for grading and surfacing on 4.9 mi. on the Otowi and Sanorita Route in Santa Fe National Forest, Sandoval County. A low bid of $290,721 was submitted by **Brown Construction Co.**, Albuquerque, for grading, surfacing and related work on 6.3 mi. on the Corona-Lon highway in Lincoln County. A low bid of $259,771 was submitted by **Santa Fe Construction Co.** of Santa Fe, for grading and surfacing on 4.4 mi. on the Hyde Park Road, State Highway 475 in Santa Fe County. **Skousen-Hise Construction Co.** of Albuquerque submitted a low bid of $508,101 for grading, surfacing and related work on the Rock-wall-Tres Ritos highway in Taos County.

OREGON

Ross R. Hammond Co., Portland, received a $1,543,578 contract for construction of the Research Medical Building at the University of Oregon Medical School in Portland. **Pacific Concrete Co.**, Portland, submitted a low bid of $503,333 for earthwork, lining and structures for Talent lateral rehabilitation, Talent Division, Rogue River Project. **C. H. Strong Engineering & Construction Co.**, Eugene, submitted a low bid of $445,988 for construction of earth dike, pumping stastion and related work at the Little Pudding River Watershed in Marion County. **J. Adron Troxell** of Seattle submitted a low bid of $309,800 for dredging and disposal of material from 27-ft. navigation channel in the Columbia River, near Bonneville Dam. **Morse Bros.**, Lebanon, received a $157,557 contract for grading and surfacing on 9 mi. of the Umpqua Highway in Douglas County.

UTAH

Alder-Child Construction Co., Salt Lake City, submitted a low bid of $1,078,790 for construction of sewage treatment plant in Davis County. **Diversified Builders and Johnson Construction Co.**, Paramount, Calif., submitted a low bid of $4,000,000 for construction of Air Force Plant No. 77-WS 133 A, Minuteman Assembly Operations at Hill Air Force Base. **L. A. Young Sons Construction Co.**, Salt Lake City, received a $420,000 contract for grading and surfacing on 2.3 mi. of the Beaver-Puffer Lake route in Fishlake National Forest in Beaver County. **W. W. Clyde & Co.**, Springville, received a $271,133 contract for construction of 2nd contract: 2 prestressed concrete beam overpass structures in city of Orem, Utah County. **Weyher Construction Co., Inc.**, of Salt Lake City, received a $677,899 contract for constructing overpass structure and one underpass structure in city and county of Salt Lake. **Fife Construction Co., Inc.**, Brigham City, received two bids for roadwork in Box Elder and Tooele counties: $296,298 for grading and surfacing north of Lucin easterly 12 mi. in Box Elder County, and $103,619 for grading and surfacing on State Road 36 in Tooele County. **Pritchett Construction Co.**, Provo, re-

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ceived a $157,926 contract for grading, surfacing and structure in city of Orem, Utah County. **Thorn Construction Co.,** Springville, received a $105,583 contract for grading and surfacing in city of Provo, Utah County. A $259,640 contract was received by **Engineers & Constructors, Inc.,** Salt Lake City, for construction of Carlile and Diamond Bar-X Dikes, Provo River Channel Revision. A low bid of $124,650 was submitted by **Herbert Plewe,** Salt Lake City, for contract for one steel underpass structure in city and county of Salt Lake.

WASHINGTON

Yuba Consolidated Industries, Inc., San Francisco, Calif., received a $3,445,000 contract for strengthening and repair modifications on the Hood Canal Bridge, Unit 1, floating structure in Kitsap and Jefferson counties. **American Bridge Division** of the **U. S. Steel Corp.,** Portland, Ore., received a $2,962,524 contract for construction of superstructure for the new highway bridge across the Columbia River at Vantage. **Paul Jarvis, Inc.,** of Seattle, received a $2,409,163 contract for construction of the Columbia River Bridge at Biggs Rapids, Klickitat County, Wash., and Sherman County, Ore. **J. J. Welcome,** Redmond, received a $1,076,912 contract for 6.7 mi. of grading and surfacing from Hobart road to Echo Lake in King County. **Puget Sound Bridge & Dry Dock Co.** of Seattle received an $810,781 contract to construct the Cowlitz River Bridge near Mayfield in Lewis County. **Fiorito Bros.** of Seattle received a $657,086 contract for 1.6 mi. of grading, surfacing and related work in and near Seattle, King County. A $423,233 contract was received by **J. W. Hardison Co.,** Yakima, for grading, draining and placing riprap on 0.6-mi. west approach to Vantage bridge, Kittitas County. **Roy L. Houck Sons Corp.,** Salem, Ore., received a $417,165 contract for constructing the Kozy Kamp Interchange in Clark County. **Neukirch Bros.,** Seattle, received a $409,828 contract for construction of Skyhomish River and Slough bridges in Snohomish County. A $357,754 contract was received by **Hannan Bros. Co.,** Portland, Ore., for constructing the Cowlitz River Bridge near Longview, east approach in Cowlitz County. **F. R. Hewett Co.,** Spokane, received a $280,337 contract for 5.3 mi. of grading, surfacing and related work on the defense access road, Long Lake, Lincoln County. A $216,099 contract was received by **R. H. Sussex** of Bellevue for 8.7 mi. of grading and surfacing on defense access road (Batum road) in Adams County. **MacRae Bros. Construction Co.,** Seattle, received a $184,838 contract for grading, surfacing and related work in the Renton vicinity, King County. A $177,948 contract was received by **Frank G. Baulne, Inc.,** Yardley, for 6.6 mi. of grading and surfacing, Mansfield to Sims Corner in Douglas County. **Del Guzzi, Inc.,** Port Angeles, received a $156,114 contract for construction of the Sekiu and Clallam River bridges and approaches in Clallam County.

WYOMING

Woodward Construction Co., Rock Springs, received three contracts for roadwork in Platte and Sweetwater counties: $674,554 for grading, 2 structural plate pipes and related work on 2.3 mi. of 4-lane highway south of Glendo in Platte County; $382,690 for grading and surfacing on the Rock Springs-Pinedale road north of Rock Springs in Sweetwater Coun-

ty, and $214,775 for grading and surfacing on 10.4 mi. on the Green River-Labarge road in Sweetwater County. A $393,114 contract was received by **Riedesel-Reiman Co.,** Cheyenne, for grading, structures and surfacing on the Sheridan-Marginal road in Sheridan County. **McLaughlin Construction Co.,** Livingston, Mont., received a $395,000 contract for 2.1 mi. of grading and surfacing on the New West Thumb-Lakeshore Route in Yellowstone National Park. **Gilpatrick Construction Co., Inc.,** of Riverton received two contracts for roadwork in Lincoln and Big Horn counties: $302,590 for grading, structures and surfacing on 3.4 mi. of Kemmerer-Ham's Fork road in Lincoln County, and $118,832 for grading, surfacing and related work on 2 mi. of the Manderson South road in Big Horn County. **Big Horn Construction Co.,** Sheridan, received a $265,667 contract for grading and surfacing between Rock Springs and Rawlins in Sweetwater County. A $229,000 contract was received by **Rocky Mountain Construction Co.** of Missoula, Mont., for slide correction on the Togwotea Pass Highway in the Teton National Forest. **James B. Kenney, Inc.,** Denver, Colo., received a $143,734 contract for structures, grading and surfacing between Laramie and Cheyenne in Laramie County. **Mullinax Engineering Co.,** Sheridan, received a $116,596 contract for grading and surfacing in Crook County.

JOHN H. HOLLAND, construction supervisor for the Alaska District, Corps of Engineers, and *Norman Berg,* vice president of Chris Berg, Inc., talk construction at a jobsite for an advanced communications station at Ocean Cape, Alaska, a primitive area of the North Pacific Coast. Chris Berg has a $2,222,100 contract for the Ocean Cape project with the Corps.

ENGINEERS and CONTRACTORS

LT. COL. JOSEPH A. BACCI being congratulated by Alaska District Engineer *Col. Christian Hanburger* on receiving the Army Commendation medal for his outstanding work as resident engineer of construction at Clear, Alaska, where a Ballistic Missile Early Warning Station is being built. See page 27 for a review of this $60,000,000 project.

Appointment of **Harold G. Arthur** of Denver, Colo., as assistant regional director for the Bureau of Reclamation's Region 6, with headquarters in Billings, Mont., is announced. He succeeds **L. W. Bartsch** who recently accepted employment with the World Bank. Arthur has been supervisor of a design unit in the earth dams section of the USBR engineering office since 1951.

* * *

A re-grouping of headquarters engineering and administrative functions in the California Division of Highways which includes appointment of a third deputy state highway engineer, involves the following promotions and assignments:

J. W. Trask, promoted from assistant state highway engineer — operations to the position of deputy state highway engineer—planning. **J. P. Murphy,** deputy state highway engineer—engineering, assigned as deputy state highway engineer — operations. **C. E. Waite,** deputy state highway engineer — administration and management,

Trask

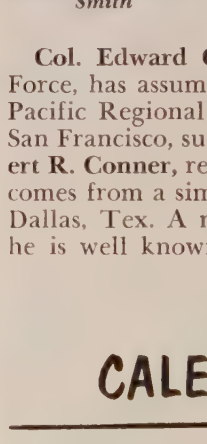
Langsner

position re-titled deputy state highway engineer-administration.

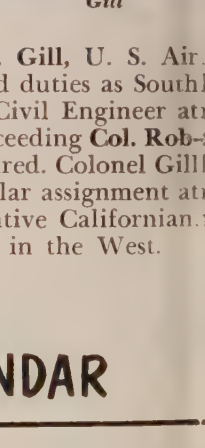
George Langsner, promoted from engineer of design to assistant state highway engineer—administration. **Lyman R. Gillis,** assistant state highway engineer—administration, transferred to assistant state highway engineer - operations. **Willard L. Warren,** assistant engineer of design, promoted to engineer of design.

* * *

Roy O. Smith has resigned from the Army Engineer District at Seattle where he has been chief of the Construction Division, to accept a position with Boeing Airplane Co. Smith has sixteen years' Federal service. During the past several years he has directed construction for such projects as the Nike sites around Seattle and Spokane, start of Howard A. Hanson project, construction at Fort Lawton, Fort Lewis, and McChord Air Force bases, and most recently nine Atlas sites at Spokane, and construction of Malstrom and Glasgow Air Force bases in Montana.



Smith



Gill

Col. Edward C. Gill, U. S. Air Force, has assumed duties as South Pacific Regional Civil Engineer at San Francisco, succeeding **Col. Robert R. Conner,** retired. Colonel Gill comes from a similar assignment at Dallas, Tex. A native Californian, he is well known in the West.

CALENDAR

Nov. 14-15 — University of California and Prestressed Concrete Manufacturers Assn. of California, conference on prestressed concrete, Biltmore Hotel, Los Angeles.

Nov. 21-22 — University of California and Prestressed Concrete Manufacturers Assn. of California, conference on prestressed concrete, Sheraton-Palace Hotel, San Francisco.

1961

Jan. 26-28 — Institute of Transportation and Traffic Engineering, University of California, annual California Street and Highway Conference, Berkeley Campus.

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"We feel we can operate 25% cheaper with our Case than with similarly-sized competitive makes." *(Vienna, W. Va.)*

"Does a thousand and one jobs . . . has more power than a larger, competitive-make I had before." *(Lake Geneva, Wis.)*

"I like my Case dozer's speed and the fact that there aren't any steering clutches to fool with." *(Lacey, Wash.)*

"In 1000 hours of operation, my Case loader cost only $100 for maintenance and repair . . . cut my overall operating costs by half." *(Indianapolis, Ind.)*

"We're loading 500 to 600 yds. a day, at operating costs of only 25¢ an hour." *(Houston, Tex.)*

"I run it 8 to 10 hours a day, 6 days a week, and never get tired." *(St. Petersburg, Fla.)*

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Contractors Machinery Co.
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Milpas Rental Service
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Woodland 7-4312 & 2-1086

Kawana Equipment Sales, Inc.
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Glenn W. Holcomb assumes national presidency of the American Society of Civil Engineers at the annual meeting this month. Holcomb is head of the Department of Civil Engineering at Oregon State College. Elected director for District 11 is **Harmer E. Davis** of the University of California. This district comprises California, Arizona, Nevada, Utah and Hawaii. In addition to being a professor of civil engineering, Davis is the originator of the University's Institute of Transportation and Traffic Engineering.

* * *

Leo M. Buhr, Chief of Construction — Operations Division, U. S. Army Engineer Division, North Pacific, Portland, has resigned following 32 years service to accept a position with the Titan Installation and Activation Division of American Machine & Foundry Co. He will be assistant field manager of the Titan missile project under construction at Beale AFB in California.

* * *

Lt. Col. Robert W. Fritz has been assigned as area engineer of the Army Engineers' Atlas ICBM construction office at Fairchild AFB. He succeeds **Lt. Col. Don D. DeFord, Jr.**, who has been area engineer for Atlas installation construction since the special office was set up. Colonel DeFord has been reassigned to District headquarters in Seattle as assistant to the district engineer.

* * *

George T. Treadwell has joined the consulting engineering firm of Tippetts-Abbett-McCarthy-Stratton as Pacific Northwest manager, with headquarters in Seattle. Treadwell recently retired as chief engineer for the Port of Seattle.

* * *

Head man of the Army Engineers' new Great Falls, Mont., area office recently opened at Malmstrom AFB, is **Lt. Col. Robert B. Kemp.** Colonel Kemp was stationed for a short time in 1946 at Morro Bay, Calif., and recently returned to the West from an assignment in North Carolina.

Lute J. Parkinson, head of the mining engineering department at the Colorado School of Mines, has been named consulting engineer for the Harold D. Roberts Tunnel, part of the Denver water diversion project, according to announcement by the Blue River Constructors which is building the 23-mi. long water tunnel. A review of the project appeared in *Western Construction,* September 1959.

* * *

George W. Adrian is the new executive engineer in the water system executive office of the Los Angeles Department of Water and Power. He replaces **Harold B. Hemborg** who was promoted to principal engineer in charge of major project design and inspection for the new water engineering design division. Adrian was formerly office engineer for the water distribution division.

NEW FILMS

How fast, modern compaction equipment can reduce job costs is illustrated in a new motion picture, "Hyster High-Speed Compaction", available from the Tractor Equipment Division of Hyster Company. The 12½-min., color film outlines development of the DW20A compactor and Model D compaction roller. This equipment increases compaction volume to match earthmoving volume. Additional information may be obtained from any **Hyster-Caterpillar** dealer, or from **Hyster Company**, P. O. Box 328, Peoria, Ill.

A new 15-min. full-color movie, "Look to the TS-360", has been produced by Allis-Chalmers. The 16-mm sound film explains the production, operating and mechanical advantages of the new 30-cu. yd. TS-360 motor scraper without using the everyday "nuts and bolts" approach. Available for showing through **Allis-Chalmers Manufacturing Co.,** Sales Promotion Department, Tractor Group, Box 512, Milwaukee 1, Wis.

The world's longest permanent transport belt conveyor system, 5½ mi., carrying limestone and shale at the rate of 1,000 tons an hour, is the subject of Link Belt Co.'s new 16-mm sound and color, 22-min. motion picture entitled "Ideal Transport Story". The film may be borrowed without cost on letterhead request from **Link-Belt Co.,** Dept. PR, Prudential Plaza, Chicago 1, Ill.

The powerful Atlantic hurricane is the villain of Bethlehem Steel Co.'s film on wind-resistant construction entitled "Fury of the Winds." The 25-min. sound-color motion picture shows how, through proper design, construction and use of steel, structures can be built to withstand the destructive force that accompanies hurricanes. Engineering societies, contracting organizations and other interested groups may borrow a 16-mm print free by writing to **Bethlehem Steel Co.,** Publications Dept., Bethlehem, Pa.

Hobart Brothers Co. has produced a new film titled "Arc Welding Electrode Selection," the first of its kind, which tells the story of basic factors which are important for correct electrode selection. The 25-min., 16-mm, full color film is particularly interesting to welding operators, engineers, production foremen and management. Reservations for a showing may be made with the film library, **Hobart Brothers Co.,** Troy, Ohio.

A 20-min., sound-color motion picture, illustrating the ease of manufacture and the many in-use advantages of prestressed concrete in the construction industry is now available for showings to contractors, engineers, government agencies, etc., by **The Colorado Fuel & Iron Corp.** Use of "Building with Prestressed Concrete" 16-mm prints can be obtained by written request to the firm at P. O. Box 1920, Denver, Colo.

A new film on building construction safety, "The High-Low Bid," is available to contractors and associations within the construction industry on loan from **Employers Mutuals of Wausau.** Prints may also be purchased. Main purpose of the film's production is to convince building contractors that safety performance has a great bearing on the over-all success of their business. Further information concerning the 27-min., color film can be obtained from Employers Mutuals' Accident Prevention Department, Wausau, Wis.

Major Fred W. Rankin, for the past two years a resident engineer for the Army Engineers District at Fairbanks, has left for an assignment in Maryland. His successor in Alaska is **Major Harry Griffith.**

* * *

George E. Hyde, staff hydraulic design engineer for civil works projects in the Southwestern Division of the Corps of Engineers, has been named chief of Portland District's Waterways Branch.

* * *

McCreary-Koretsky Engineers is the new consulting engineering firm created when Porter, Urquhart, McCreary & O'Brien dissolved due to the death of **Leonard C. Urquhart** last March. MKE is continuing with the San Francisco facilities, personnel, and address of the former PUMO. The new firm also maintains offices in Sacramento and Seattle.

* * *

H. A. Squires of Reno is replacing **Joseph D. Meacham** as chief maintenance engineer of the Nevada Department of Highways. Squires had been assistant division engineer of Division II.

* * *

Following the death of **Leonard A. Parr,** when the firm of Hansen and Parr was sold to McGregor-Triangle Co., Boise, Idaho, **John H. Hansen, Jr.,** agreed to serve as president for a year. He has now discontinued his services, and following a vacation, plans to resume activity in the bridge construction field.

* * *

Horace J. Gunn has been appointed executive manager of the Intermountain Branch of Associated General Contractors, Salt Lake City. He replaces **W. D. Eldredge** who resigned recently. Gunn has been chief of the information and education division of the Utah State Road Commission.

* * *

Franklin T. Matthias has been appointed manager of heavy construction for Kaiser Engineers. Before joining Kaiser Engineers recently Matthias was chief engineer and director of engineering and construction for the Aluminum Co. of Canada.

J. B. Allen & Co., general contractors, have opened offices in Santa Barbara, Calif. **John Allen,** president of the new firm, was for twenty-two years with James I. Barnes Construction Co. The new company, located at 36 E. Mason St., is composed of several former Barnes employees from Barnes' Redwood City and Pomona offices, both of which are being closed.

* * *

Maurice G. Anderson has been named resident engineer for new Interstate highway construction near Orem, Utah. He is assigned supervision of construction of structures on a $293,741 contract awarded to General Contracting Corp. for two prestressed concrete beam overpasses. The other job, also for two prestressed concrete structures, is being handled by W. W. Clyde & Co. at $271,133.

* * *

Col. Robert R. Robertson has assumed his position as deputy division engineer for the South Pacific Division, Corps of Engineers. He comes to San Francisco from an assignment in Washington, D. C.

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SUPERVISING the jobs

LeRoy Adams, superintendent for Siegrist Construction Co., has charge of a $191,015 award for 5.4 mi. of grading, surfacing and structures, between Wyoming line and Kings Canyon in Colorado. Earmarked for completion the end of September, job has been under way since early July.

* * *

Dan Carson is supervising a $123,851 job for L. H. Weber, Contractor, in Albany County, Wyo. Work covers grading, draining and related work on the Filmore-Albany road. **Richard R. Stapp** is engineer on this job which will finish in September.

* * *

N. V. Lamb of Lamb Construction Co. is acting as his own superintendent on highway construction in the amount of $235,437 in Crook County, Wyo. General foreman for this project covering 4.9 mi. of grading, two structures and surfacing west of Aladdin is **Alfert A. Myrup.** Other key contractor personnel are **Jerry J. Lamb,** foreman on fence construction; **Raime V. Fosher,** chief of maintenance, and **Frank Weyrich,** chief mechanic. Job is expected to be finished in October.

* * *

Leo V. Lockman, under the overall direction of **Henry H. Miller** and **Selmar A. Hutchins,** has charge of construction of upstream slope reinforcement for Hills Creek Dam on the Middle Fork Willamette River, Ore. This contract was awarded to Miller & Hutchins Contractors on a low bid of $191,800 and work is now finishing.

* * *

Dick Simmons, superintendent, **Howard Shelton,** foreman, and **Marsh V. Wilson,** timekeeper, are key men on a recent contract awarded Z. H. Lowdermilk, Inc. The $1,297,073 job covers 4.5 mi. of grading, structures and asphalt surfacing on Rabbit Ears Pass—west, in Routt County, Colo. With work under way since July, project is earmarked for completion the autumn of 1961.

* * *

Paul Hunt is acting superintendent on a $273,802 contract in the hands of Hunt Construction Co., with **Clyde Weatherly** serving as structure superintendent, and **Carl Folger** as grade foreman. Work is on State Highway 26 east of Beulah, Colo., and consists of 1.7 mi. of grading, surfacing, and structure. The Armco multi-plate structure assembled by the contractor measures 328 ft. long and 18½ ft. in diameter. Under construction since early in July, project will be completed about Nov. 1.

* * *

E. E. Anderson and **James N. Leimbach,** project manager and general superintendent, respectively, are key men employed by Slate, Hall and Hamilton on this contractor's $7,414,833 project covering 5.9 mi. of 4-lane freeway on U. S. 99 south of Castella, Shasta County, Calif. Other top personnel on this big job are **E. W. "Brownie" Yoder,** crushing superintendent, **Glen Morin,** concrete superintendent, and **C. W. "Dud" Dillon,** master mechanic. December 1962 is the target, work having started last June.

* * *

Theodore G. Mahas, superintendent, and **RaMon Jensen,** foreman, are Skyline Construction Co.'s principal supervisors on contract for construction of school in Kaysville, Utah. Carpenters on the $1,077,000 project are **Verney Asay, Robert Bryant, Clarence Little,** and **Ervin Mason.** Completion date is August next year.

* * *

Ed Bilsborough, project superintendent, heads the list of job personnel working for Peter Kiewit Sons' Co., successful bidder for completion of the Greenbrae Interchange on U. S. 101 in Marin County, Calif. Project involves reinforced concrete "Y" structure 1,100 ft. long (5,200 cu. yd. concrete); 14,000 lin. ft. pipe piling; 85,000 cu. yd. roadway excavation; asphalt connecting roadways, etc. **Jack Tribolet** is office manager. Other key contractor men are **Dave Brown,** bridge superintendent; **Lonnie Lant** and **R. D. Hanlin,** carpenter foremen; **M. E. "Cappy" Capps,** pile-butt superintendent; **F. F. "Whitey" Boettcher,** labor foreman, and **Bob Powers,** HDR foreman. Under way since June, Kiewit expects to complete the job next July.

* * *

O. L. Webb is general superintendent on a $932,081 project of 10.7 mi. of grading, surfacing and related work on State Highway 17, Dulce-south in Rio Arriba County, New Mex., which Allison-Haney, Inc., has had under way since last June. Other key supervisors for Allison-Haney are **Clyde Reams,** grading foreman; **J. W. Shaw,** pipe foreman; **Seth Henderson,** bridge foreman, and **T. E. Dofy,** crusher foreman. Timekeeper is **Jim Marjerison.** Work is expected to be finished about June next year.

* * *

Nelson "Pat" Richardson, project manager, **George Cavanaugh,** project engineer; **June Yeary,** concrete superintendent, **Paul Henry,** master mechanic, with **Fred Carlson,** office manager, comprise the key men on a $1,249,000 project recently awarded to M. M. Sundt Construction Co. and M. J. Bevanda Co., Inc. Job consists of replacement of taxiway and access apron and construction of optical landing system at the Marine Corps Auxiliary Air Station, Yuma, Ariz.

* * *

L. A. Young, Jr., and **Alan Young** have been acting as their own superintendents in the award of $136,356 to L. A. Young Sons Construction Co. to grade and surface city streets in Gunnison, Colo. Foremen on the job are **Al Young** and **Clark Johnson.** Job is now about finished.

* * *

Fred B. Pitcher, general superintendent, is in charge of Pitcher

Construction Co.'s recent award for Rearward Communications facilities at Paxson AFB, Alaska. Costing $301,336, the contract covers 3½-mi. road, equipment building, and 300-ft. WECO tower. Other key men are **Jack Wright,** earthwork superintendent, and **Al Mallon,** tower erection superintendent. Work started last July and will be finished in December.

* * *

A. M. Stolzenburg, Earl Fisher, and **Eldon Ulshafer,** superintendents for Albert LaLonde Co., are the key men on 5.7 mi. of grading, gravel, surfacing, plant-mix oiling and small drainage structures on the Bozeman-Wilsall road in Gallatin County, Mont. LaLonde won the award on a low bid of $470,572.

* * *

F. C. Crilly, project manager, **Galen Sissel,** paving superintendent, and **John Wolfe,** office manager, are top supervisors on a concrete paving contract recently awarded to Roberts Construction Co. and Western Paving Co. The $739,395 job is for 1.8-mi. construction in city of Albuquerque, N. Mex. Work will be finished in December.

* * *

Lyle R. Fish, project superintendent, is in charge of Tanner Brothers Contracting Co.'s job of 2.5 mi. of grading and surfacing on the Cordes Junction-Flagstaff highway in Arizona. Superintendent on the $406,552 contract is **Evans M. Tanner. James Rolle** is timekeeper. Under construction since August, the work will finish in December.

* * *

Gail Loop is assigned to superintend an $816,194 contract for Big Horn Construction Co. in Carbon County, Wyo. Job consists of grading, surfacing and other work on 4-lane divided highway, Rock Springs-Rawlins road west. **Les Cundy** was named labor foreman. July 1, 1961, is the target date.

* * *

T. G. Moore, general superintendent, and **T. C. Carr,** concrete superintendent, head the job personnel working for Armstrong & Armstrong on a $658,964 project in Dona Ana County, N. Mex. Job consists of 5.9 mi. of grading and surfacing, drainage structures and one diamond interchange north of Anthony. Started in October, work will run till May 1961.

* * *

Don H. Mahaffey of Don H. Mahaffey drilling Co. is acting as his own superintendent in drilling the caissons on a 26-story apartment building in West Los Angeles. **Gerald "Dutch" Konrath** is drilling foreman, while **Percy Melchor** is underground belling foreman. Mahaffey reports ground conditions vary from hard firm clay to soft sandy silt and water strata next to an underground storm drain which the building will straddle. Prime contractor is the joint venture of Johnson, Drake & Piper, Inc., M. J. Brock & Sons, Inc., and B. C. Dean Co.

* * *

L. C. Machay is superintending a $427,973 award to Dodge Construction, Inc., to construct a portion of U. S. 6 east of Warm Springs, Nev., about 10 mi. of grade, select material base, plant-mix surface. Other important men are **Bob Vicks,** grade foreman, **George Griffith,** engineer, and **L. E. Peck,** hot plant engineer. The job has been under way since Sept. 1. Paving will be done in the spring after the winter shut-down.

* * *

Liland McKibbin, general superintendent, **Dan Grandpre,** project engineer, and **Bob King,** office manager, comprise the top personnel on a recent award to the Hooker Company covering grading, surfacing and widening on U. S. 395 in San Bernardino County, Calif. Hooker won the contract on a low bid of $530,730, started work in October, and expects to be finished in February next year.

* * *

G. G. Bawden, project manager for Guy F. Atkinson Co., has charge of this contractor's $16,237,675 contract for 12 mi. of 8-lane freeway including 10,000,000 cu. yd. of excavation located in city and county of Los Angeles. Besides grading and surfacing, con-

tract includes 4 undercrossings, 1 overcrossing and 6 pedestrian undercrossings plus related work. Other top Atkinson men here are: **"Dutch" Hendricks,** excavating superintendent; **Bill Rushing,** storm drain superintendent; **Ray McLellan,** structures superintendent; **"Hap" Hamann,** project engineer, and **Ken Westfall,** job office manager. Scheduled for completion September 1962.

* * *

L. E. McDaniels is superintending a $702,890 job under the direction of **Frank Ivaldi,** president, and **Ernest Ivaldi,** vice president, of the East Bay Excavating Co., Inc., successful bidder on a highway project in Hayward, Calif., consisting of widening to provide a 4-lane divided highway on 4.1 mi. **Warren Case** is estimator on the job. Operators are **Fred Haack** and **Tony Brun.** Scheduled for completion next March, job started in September.

* * *

George South is supervising Rognstad-Olsen Construction Co.'s recent award in the amount of $255,748 for grading, 6 bridges, 1 box culvert, and surfacing near Buffalo, Wyo. Work started in September; will finish August 1961.

* * *

Roy Ladd, project manager, and **Jack Griffin,** superintendent, head the job personnel for Gibbons & Reed Co., contractor who won the award for construction of Whiskeytown Dam, a feature of the Trinity Project in Shasta County, Calif. Covered in the winning bid of $6,215,577 are earth-dam embankments, tunnel spillway, tunnel outlet works, and roads. Other key contractor men are **W. K. McGlothlin,** tunnel superintendent, **Jim Cox,** office manager, **Bill Gear,** engineer, and **Ade Cox,** master mechanic. Work started in August and is expected to extend into February 1963.

* * *

Art Allen, Dave Clifton and **Jim Mullen,** construction manager, superintendent, and supervisor respectively, are Arizona Sand & Rock Co.'s key men on 2.3 mi. of grading and surfacing on Camelback Road, Maricopa County, Ariz. Costing $253,387, the job got under way Sept. 7, earmarked for completion the end of next February.

MASTER MECHANIC

Apprentice training program scuttled as parties disagree

FOLLOWING a recent meeting between EMSA representatives and representatives of the Operating Engineers, AGC and EGCA, the apprenticeship and training program that has been pushed by EMSA officers and members has been virtually killed. According to EMSA president Bob Moodie, there is little likelihood anything further will be done to get the badly-sought program under way, at least in the near future.

Los Angeles

"Our plan was to develop a program for the mechanics," states Moodie. "This could be handled without too much cost and serve as a starter for a larger program for the operators. We still feel this is the way to go about it, but are willing to tackle both groups simultaneously as the Union demands if that is the only way we're going to get the program going."

Frank Boyce, who represented the AGC at the joint meeting, explains the AGC position by commenting that no significant headway was made and could give no indication of the importance of the apprenticeship program in the eyes of AGC. He suggested AGC felt costs might be too high for the combined program and that it was up to the Union (Local 12 of Operating Engrs.) to offer estimated costs of the program. It is believed that AGC favors beginning with the mechanics' end of the program, though no official statement on this was made by Boyce.

EGCA's Al Atwood registered concern for the future of the training program, though he felt that attempting to launch such a program for both mechanics and operators simultaneously would prove disastrous for the smaller contractors.

"Unlike trades like the carpenters," explains Atwood, "the journeyman operator and his apprentice will not be able to produce at the same time. One is going to be working while the other watches. When you have thousands of manhours tied up in this sort of thing, it will hurt. Before EGCA can show much interest in the whole program, we must know what the cost will be. Until we get this information from the Union, we're going to push for the EMSA's idea."

Ralph Bronson of Local 12 of the Operating Engrs. reports that the program has come to a complete halt and doubts whether any-

thing further can be done with it.

"If the contractors kept a record of what it costs in equipment breakdowns to have untrained men on the job, they'd see that they're already paying the so-called 'extra costs' of training men, and then some.

"We want this program very badly and know that it'll cost something at the outset. But the whole construction industry is going to benefit in the long run. We're willing to pay all the administrative costs of this program. Trying to separate the mechanics and the operators is unrealistic. Poor operators constitute the industry's biggest headache."

No further meetings of the representatives are scheduled. There are reports that the apprenticeship program will be brought up in the course of contract negotiations and that the Union will prepare cost estimates in the interim. For the present, however, all agree that if EMSA's apprenticeship idea isn't dead, it is in deep hibernation.

Drum warmer heats viscous materials

A FULLY AUTOMATIC, 5-gal. drum warmer that quickly heats viscous materials and maintains them at the temperature and consistency required for easy removal from drums has been announced by the Harold L. Palmer Co.

Additional features include: choice of two thermostatically-controlled temperature ranges, 60° — 250° F., or 200° — 550° F.; 2-inch sheet fiberglass insulation; aluminum reflector; wire-reinforced flexible asbestos gasket for snug fit around drum. The unit plugs into any 110-120 volt outlet, weighs 22 pounds and is equipped with handles for easy portability.

. . . Write No. 154

Ripper forging process shown at Berkeley firm open house

SOME 50 MEMBERS of the Bay Area EMSA chapter followed step by step the process of transforming a 500-lb. billet of hot steel into a ripper shank during an open house staged by the Berkeley Forge & Tool Co., Berkeley, Calif.

The visit started with the forge room, where heavy steel chunks were withdrawn from heating furnaces with the aid of a chain hoist and a giant set of tongs, placed on the anvil of a giant steam hammer and smashed into shaped slabs of precise thickness. (Steel spacers placed on the anvil regulated the depth of the hammer stroke to control thickness.)

The slightly different process of forging points using dies in the anvil and hammer also was demonstrated. Here a smaller 20-lb. billet was placed in the shallow side of a pair of dies, hammered into rough shape, and then moved over to the deeper die in which it was forged to its finished form.

Tour was conducted by Sid McVicar and Stan Bierwith, partners in the forge company, assisted by metallurgist Mike Digan, and Don Jones of the Saber Tooth Co.

Visitors followed the forged blanks to the trimming room, where the shanks were trimmed to size by an automatic burning torch following the edge of a metal template mounted above the blank.

Final stage of the manufacturing took place in a new heat treat plant where finished pieces were re-heated to erase changes in grain structure induced during trimming, and tempered in brine and oil baths.

Refreshments followed the tour, and visitors were shown the firm's

ull line of forged construction products, including rebuilt points nd end plates, and replacement aps for sheepsfoot rollers, as well s the Saber Tooth line of rippers.

Purchasing of parts reviewed

EFFECTIVE purchasing in the equipment maintenance industry, s in other industries, depends on areful value analysis and standardization procedures, members f the Bay Area Equipment Maintenance Supervisors Association were told at a recent chapter meeting.

In a film and lecture presentation, Robert Gammon, purchasing agent for U. S. Steel's Alameda division, discussed some of the practical steps for reducing costs and increasing profits at the buying end of equipment maintenance. Value analysis and standardization, he pointed out, first means getting acceptable quality at the greatest cost saving by evaluating (1) the function of the item, (2) its maintenance cost, (3) possible alternates, (4) cost of the alternates, and (5) acceptability of the alternates; then standardizing item types and part stocks to be purchased.

Bay Area

In an open question-answer period, the importance of close cooperation between purchasing agents and actual maintenance personnel was emphasized. Too often a lack of coordination here results in a stock of obsolete parts, for example, or in high replacement costs. Even when a purchasing department is responsible for screening the flood of salesmen who call on a company, it is important for the maintenance supervisor to be consulted on purchases and kept informed about new products.

It was noted, finally, that in choosing a distributor or supplier, ready availability and adequate stock of replacement parts is an important consideration. When necessary replacement parts are not available from the local supplier, and must be shipped air freight from the factory, any original saving in the cost of equipment may be lost.

CONSTRUCTION BRIEFS

Portable generator-sets power aggregate plant at Rocky Reach

PORTABLE diesel generators were chosen by Curtis Construction Co., Spokane, Wash., to power its crushing plant at Rocky Reach Dam in preference to tapping into nearby commercial power lines when the company found the generating unit operation was cheaper than installing the necessary lines for commercial power.

Arranged for top portability, the Caterpillar D353 electric sets are mounted on a semi-trailer with their own 2,500-gal. fuel tank and load switching gear. Quick-connect cable junctions permit fast hookup when it is necessary to reposition the trailer. Normally one electric set alone is sufficient to power the operation. On heavy demand days, both sets are used. Rocky Reach Dam, latest in a series of power dams on the Columbia River, is located above Wenatchee, Wash. Being built by the Chelan County Public Utility District, the dam's capacity will eventually generate commercial power of 630,000 kw.

Relocation of 25 miles of U. S. Highway 97 which runs through the area and 25 miles of Great Northern Railway mainline were primary parts of the contract. Curtis is furnishing railroad and highway ballast in 2½″ minus for the job. In addition, Curtis' plant produces highway top course sized ⅝″ minus and asphalt batching aggregate in ⅝″ to ¼″ minus.

The natural sedimentary gravel deposit is located just above the crusher on the relocation jobs. An ideal setup for high-speed crushing, the deposit can be fed by bulldozers. One Caterpillar D8 equipped with a straight blade and a U-blade equipped D9 doze into a feed hopper. From the hopper, an electric-powered conveyor belt carries the raw aggregate to a 24 x 36 Universal Jaw Crusher for primary crushing. From the primary, material is carried by conveyor to a double 4′ x 14′ Symons screening unit. From here it goes to a 4¼′ Symons cone and a 54″ x 24″ Pioneer Roll Crusher; then back through the screening unit where 2½″ to 5⅛″ road aggregate is removed and directed by conveyor to a 24-yd. loading bin for transfer to 30-ton trailers pulled by Autocar tractor trailer units.

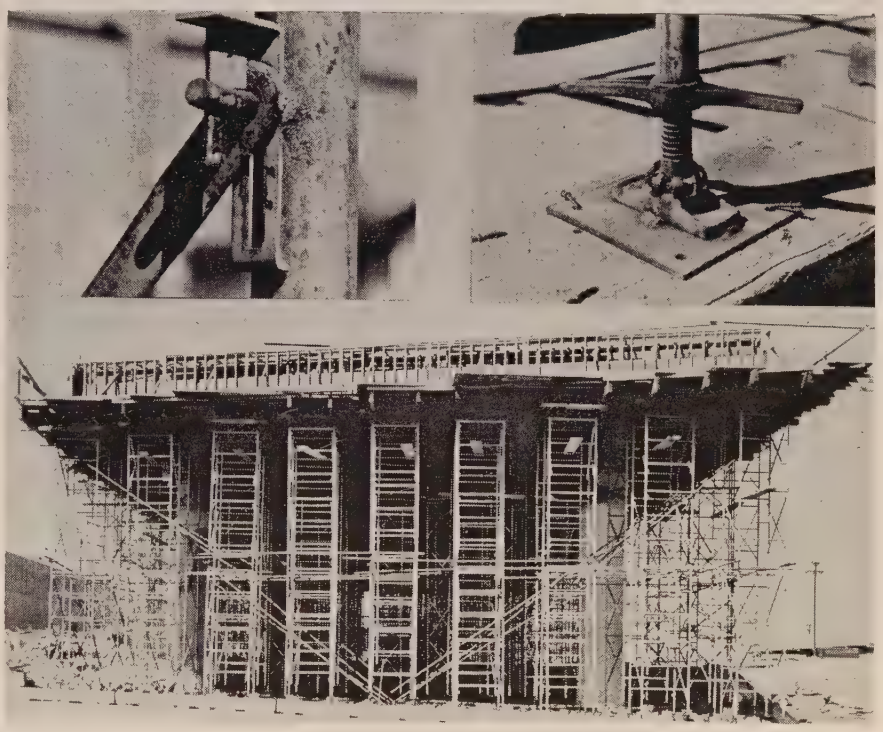
Trim wire rope to increase its life

Contractors can increase wire rope lift of their cable equipment by following a simple procedure, says the service department of International Harvester Co.'s Construction Equipment Division.

The procedure consists of cutting periodically—a weekly interval is just about right for scraper and dozer blades—several feet from the end of each piece of cable used to operate construction equipment.

This step is recommended because on every hoisting job there's a spot where the rope is constantly bent over a sheave when the load is heaviest. This section wears the fastest and, naturally, will be the first to weaken.

The wear spots can be relocated, and wear evenly distributed throughout the cable length, by removing the cable from the control unit drum, pulling through a foot of it and cutting off the excess.



STEEL SHORING ERECTED WITHOUT BOLTS

TOWERS OF tubular steel scaffolding support the structure of the Soto Street Overpass in Los Angeles. This overpass is part of the new Golden State Freeway, a new link in the network of the city's traffic control system. The key to the versatility of the scaffold is the combination of a snap-on connector and a flexible leveling plate. The connector, called the WACO Speedlock, consists of a ½-inch diameter, V-head pin made of C-1012 steel and a clamp formed of hot rolled strip. The pin and steel for the clamp are supplied by the Los Angeles plant of Bethlehem Steel Co., Pacific Coast Division. The pin is cold headed by Bethlehem on a 5/8-inch header and slotted and punched by Superior Tool & Die Corp. of Los Angeles. In use, the V-head of the pin is welded to tubular steel scaffold frames. A diagonal brace with holes in either end fits over the pin and the clamp is pushed through the slot in the pin. The result is a rigid box structure that can be built to any height with no bolts, threaded studs, or special tools required.

The adjustable leveling plate consists of a 1½-inch diameter round with continuous modified acme thread to 19 inches above the head. The head is rounded and fits into a socket welded to the steel base plate. *. . . Write No. 155*

TV camera spots trouble on pipe job

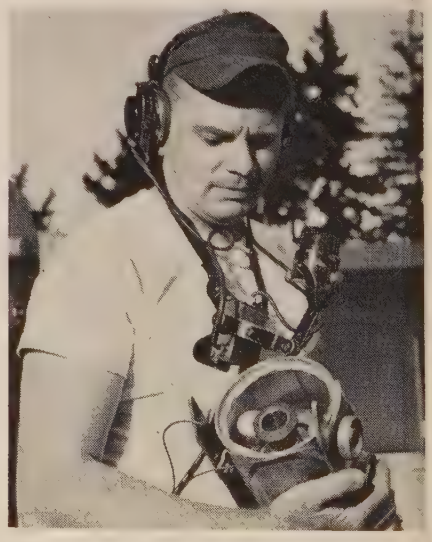
LEE HOFFMAN, Inc., Beaverton, Oregon contractor, has developed a closed-circuit television unit for inspection and trouble-shooting on sewer pipelines and equally inaccessible areas, according to an announcement made recently.

It is the first unit of its type in the Pacific Northwest.

Housed in a 1½-ton truck, the self-contained unit includes a water-tight miniature camera equipped with two 28-volt aircraft lights, coaxial cable which can reach as far as 10,000 feet, and a monitor that looks like the average living room television set. Nerve center of the operation is a 12 x 15 in. control box.

The unit was developed by Chief Engineer Gordon L. C. Scott, based on the Dumont closed circuit television system. Scott, one-time Corps of Engineers officer, incorporated conveyor wheels mounted as "runners" on each side of the 20-pound camera to permit free running over possible debris on the bottom of pipelines. He also worked out a send-and-retrieve system incorporating a blower, a miniature parachute attached to nylon line, and a one-ton winch that moves the TV "eye" through pipes and other areas at a rate of 15-feet-per-minute.

Trouble spotted by the camera shows up on the monitor, then a telephone signal to the winch op-



Miniature camera is heart of new self-contained closed-circuit television unit for inspection of pipelines. Holding unit is TV crew chief Roy Bentz.

erator stops the camera to permit study and photographs of the area.

The group plans to make the unit available to other business and industry in addition to its parent company, according to Scott.

Small dam design book published

A NEW technical book, *Design of Small Dams,* has been published by the Bureau of Reclamation as a guide to small water resource organizations, public agencies, and private engineers engaged in the design and the construction of small dams and retention reservoirs, the Department of the Interior announced recently. There was a wide, continuing demand by the public for technical assistance by the Bureau's staff in the planning for and design of small dams. This demand has become more acute since an earlier Government publication, *Low Dams,* published in 1938, had been out of print for several years.

In the preface to the 611-page volume, Commissioner Dominy pointed out that the new book is intended to serve primarily as a guide to safe and economical practices for those concerned with the design of small dams in public works programs in the United States. "The book will serve this purpose in three ways," he said. "(1) It will provide engineers with information and data necessary for the proper design of small dams. (2) It will provide specialized and highly technical knowledge concerning the design of small dams in a form that can be used readily by engineers who do not specialize in this field. (3) It will simply design procedures for small earthfill dams." The book was prepared by Bureau personnel at the Commissioner's office in Denver, Colorado, under the direction of Grant Bloodgood, Assistant Commissioner and Chief Engineer, and L. G. Puls, Chief Designing Engineer.

Copies of the new publication may be obtained from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C., or the Bureau of Reclamation, Denver Federal Center, Denver, Colorado, Attention 841. The price is $6.50, postpaid.

NEW LITERATURE

The largest wheel Traxcavator

The largest model in the **Caterpillar** line of wheel Traxcavators is described in a 12-page brochure which is well illustrated and written in great detail. Full specifications are given on the bucket (standard capacity 2¾ cu. yd.) hydraulic system, engine, transmission, brakes, tires, steering. The weight is about 26,400 lb. and the width of the bucket, the widest part of the machine, is 8 ft. 8½ in. Among the attachments which are described is a light material bucket, counter-weight, quarry bucket, a side-dump bucket, and a fiber-glass cab. . . . *Write No. 156*

Try a Thunderbird roller

A 3-color 8-page brochure describes a complete line of compacting rollers manufactured by the Oklahoma firm of **Thunderbird Engineering, Inc.** Included in the Thunderbird line is a pneumatic self-propelled rig in six models from 3 ton to 40 tons employing individual oscillation on all wheels front and rear, a pull type pneumatic from 3 to 10 tons, a 50-ton pneumatic pull-type with 4 ballast boxes removable from the rear, a grid-type pull rig and a sheepsfoot roller available in 2 sizes. Each model is illustrated and described in the brochure. . . . *Write No. 157*

Deluxe tandem rollers

Deluxe tandem rollers are the subject of a 4-page bulletin released by **Buffalo-Springfield Co.,** Division of Koehring Co., manufacturers of road rollers and compaction equipment. The models described vary from 8- to 14-ton and are offered with torque converter drive as standard equipment. A 4-speed mechanical transmission is optional. The models also feature exclusive adjustable bevel gear final drive, fully enclosed armored frame, single unit power assembly, full working visibility, and rigid frame construction. . . . *Write No. 158*

Data on Cationic Bitmuls

Complete technical and descriptive information on Cationic Bitumels is contained in an 8-page bulletin available from **American Bitumuls & Asphalt Co.** The bulletin contains a brief story explaining the advantages of Cationic Bitumuls, with simplified drawings illustrating how this product uses the principles of ionization to achieve superior results. Among the advantages claimed are: treats most aggregates; takes a fast set, even using damp aggregates; permits roadbuilders to start work earlier in the year. The bulletin contains information on how to use and apply Cationic Bitumuls, describes the advantages of its use for surface treatment with coarse aggregate road mixes, with stockpile mixes, and with sand-mix bases; lists data on storage and handling of the material; and features a description of the laboratory equipment used by the manufacturer for development and improvement of the product. . . . *Write No. 160*

Asphalt batch plants

A full line of automatic and semi-automatic asphalt batch plants made by **Barber-Greene Co.** are described in a 3-color 32-page brochure which lists a dozen design features, among which are advanced cycling principles, 25% more weigh hopper capacity, and exclusive "Dynamix" pugmill. Through extensive use of photographs, cutaways and diagrams, these principles, incorporated into all sizes and models, are explained clearly and simply. The brochure also describes and illustrates a complete line of matched and improved auxiliary equipment for all plant sizes and types. Among these components are dryers, dust collectors, wet collectors, automatic fines metering systems, and a wide range of aggregate handling and feeding equipment. . . . *Write No. 159*

Ford tractors and equipment

Beautiful 4-color photographs are the feature of a 16-page booklet just published showing loaders, backhoes, dozers, Earthcavators, fork lifts, cranes, and other industrial equipment in use with **Ford Motor Co.** tractors. Applications described include heavy and light excavating, heavy and light loading, scraping, leveling and grading, lifting, towing and general utility. The booklet is entitled "Ford Tractors, Equipment for Construction," and is free on request. . . . *Write No. 161*

Crawler-mounted shovel-crane

Just released by the **Thew Shovel Co.** is a 12-page catalog on their Lorain 50, a 25-ton 1-cu. yd. crawler-mounted shovel-crane. The 2-color booklet gives details of construction, including Lorain's "Joy-Stick" controls, square-tubular-chord-boom, oil-enclosed travel mechanism and many other features as well as photographs of the machine in action. The Lorain 50 is a versatile rig which easily converts to shovel, crane, hoe, clamshell, or dragline. . . . *Write No. 162*

Two new tractor shovels

The two largest capacity "Michigan" tractor shovels, Models 275A and 375A are described in a new 4-color 20-page bulletin issued by **Clark Equipment Co.** Complete specifications for both models, the 275A with 262 hp. and a 4½-yd. bucket and the 375A with 335 hp. and a 6-yd. bucket are given, together with information and illustrations on application of the tractor shovels to heavy-duty high production projects. Booklet is broken down into convenient sections on each model. Among the major subjects treated are power train, hydraulic system, engineering features, and maintenance. . . . *Write No. 162A*

Build roads with stabilization

Roads with long life are being built from sub-grade to surface with local materials thoroughly mixed in place, often with stabilizing additives to improve certain qualities, and compacted and sealed. An 8-page brochure published by **American-Marietta Co.** describes this method of road building and the company's line of machines which can be used. Although the company's machine (Pulvi-Mixers and Trav-L-Plants, spreaders and compactors) are illustrated and briefly described, brochure is mainly devoted to drawings which show step-by-step the advantages of stabilization in road building. . . . *Write No. 163*

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ANTI-STRIPPING ASPHALT ADDITIVE

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VENEZUELA: South American Petrolite Corporation, Hotel Avila, Caracas

REPRESENTATIVES

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GERMANY: H. Costenoble, Guiollettstrasse 47, Frankfort, a.M.
ITALY: NYMCO S.p.A. 9, Lungotevere A, da Brescia, Rome
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NEW EQUIPMENT

Obtain more information on these new developments in construction equipment by writing the corresponding numbers on reply postcard.

L-W introduces giant 60-ton end-dump truck

A 60-ton unit, largest in its lines of Haulpak off-highway end-dumps was announced by **LeTourneau-Westinghouse Co.** The new Model 60 which was introduced along with the somewhat smaller Model 42 has a payload capacity of almost twice its own weight. The truck uses extra high strength steels and fabricated units in construction and weighs only 31 tons. It is powered by a 550-hp. Cummins V-12 turbocharged diesel engine, with an Allison torqmatic transmission with 6 speeds forward and a top speed of 46.6 mph. The off-road hauler uses earthmover type components and has no conventional axles or springs. These are replaced by the exclusive L-W "Hydrair" suspension system composed of 4 big pistons acting like giant shock absorbers. The entire steering system is protected above or within the frame giving the truck almost twice the ground clearance of conventional vehicles. The Model 60 has a wheel base of only 156 in. making it extremely maneuverable. Dump-body is built in a deep V design to keep the center of gravity as low as possible. Exhaust gases are circulated around the body through the hollow box section supports to keep wet cold material from sticking to the surface. . ***Write No. 164***

Side dump truck body

Aluminum alloy dump bodies capable of dumping to either side and available as truck bodies or with full trailer under carriage are announced by the **Differential Company.** Called "Wagon Train," each 8 ft. wide by 14 ft. long trailer is capable of carrying 10 cu. yd. of

material and may be attached in tandem to a dump truck. The single stroke hoist cylinders operated from the tractor tab tilt the wagon body to a 55-deg. unloading angle. Each wagon weighs 5,000 lb. and utilizes 3,600 lb. of high strength aluminum alloy. Aluminum spoke wheels also are used to further reduce over-all weight. . ***Write No. 165***

NOT AN IDLE HOUR IN 72

NEW TROJAN 304 WORKS 12 HOUR DAY IN QUARRY

TROJAN MODEL 304
18,000 LB. LIFTING CAPACITY

Here's one more example of Trojan's ability to tackle the toughest of jobs. Ask your distributor for all the facts on the complete Trojan line today.

NEW HOPE CRUSHED STONE & LIME CO.
NEW HOPE, PENNSYLVANIA

Superintendent *Edgar Putman* says: "The word production took on new meaning after we put our Trojan 304 on the job. It's a real work-horse on all our material handling operations. Trojan's simplicity of maintenance and economical operation make it the best machine we've ever owned."

"Loading 25 yd. trucks now's a snap!" said operator *Oscar Fisher*. "Trojan's exceptional reach allows me to spot-load even the biggest of 'em. Then too, Trojan's safety curve lift arms allow me to operate worry free. Believe me, this fact alone makes a big difference at the end of the day.

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MacDONALD EQUIPMENT CO. Denver, Colorado
MANITOU EQUIPMENT CO. Portland, Oregon
NORMONT EQUIPMENT CO. Great Falls, Montana
ROAD MACHINERY CO., INC. Phoenix, Arizona Branch: Tucson
SIERRA MACHINERY CO., INC. Reno, Nevada
TRACTOR SUPPLY CO. San Diego, California
WESTERN MACHINERY CO. Idaho Falls, Idaho Branch: Boise
WESTERN MACHINERY CO. Salt Lake City, Utah
MACHINERY SUPPLY. INC. Stockton, California
LIFT TRUCK SERVICE CORP. Fresno, California

. . . for more details, write No. 45 on Reader Service Postcard

Compact exploration drill

The Minuteman Portable Drill, a compact unit capable of drilling core holes to depths of 200 ft., is announced by **Mobile Drilling, Inc.** The multi-purpose rotary unit which weighs only 150 lb. is designed for sub-surface exploration and production drilling in soils, rock and concrete. Powered by a 6-hp. air-cooled engine, it has an 8-speed automotive transmission, diaphragm type carburetor for drilling at any angle, 44-in. stroke with power or hand feed both in and out of the hole. Base is wheel mounted and has two point anchoring for maximum stabilization. It handles continuous flight augers from 3 to 12 in. diameter and drives 6 in. diameter augers to 30-ft. depths. Equipped for core drilling, it drives EW core barrels to 200 ft. Equipped for masonry drilling, it cuts cores of 1 in. to 8 in. diameter. The Minuteman is designed for one man portability but it may be adapted for truck or trailer mounting as well. Supplied as a basic package including 25 ft. of 3-in. diameter auger, it is priced at $1,485 FOB factory. *. . . Write No. 166*

Vibrating plate compactor

Addition of the VPG 3000 Vibro Plate to its line of portable compaction equipment is announced by **Wacker Corp.** The VPG 3000 is powered by a 4-cycle gasoline engine with centrifugal clutch for easy steering. It has a forward travel speed of 40 fpm. delivering 2,700 lb. impact at 4,000 cycles per minute. Plate has 720 sq. in. of compaction surface and can be coupled in series with a second unit easily handled by one operator. It is recommended for trench backfilling as well as compaction of base material for large concrete floor areas. *. . . Write No. 167*

Trojan tractor shovel

Addition of Model 254, 15,000 lb. capacity to its line of tractor shovels is announced by **Trojan Div. of Yale & Towne Mfg. Co.** The new unit incorporates such features as full power shift transmission, planetary axles, power steering, and 4-wheel powered hydraulic brakes. The unit offers a complete line of attachments and

has a road speed of 24 mph. Bucket sizes of 2 to 3 cu. yd. are available. Total weight of the Model 254 Trojan is 24,500 lb. It has an overall length of 20 ft. and maximum width of 8 ft. 10 in. Forty-degree bucket tip-back at ground-level carry position is provided. Fully adjustable bucket seat, lights, and complete panel instrumentation are standard equipment.

Trojan tractor shovels in a wide range of capacities up to 18,000 lb.

. . . Write No. 168

Electric tower crane offered by Bucyrus-Erie

The first American-made tower crane (a type widely used in Europe) is announced by **Bucyrus-Erie Co.** Developed for use on multi-story building erection and major construction projects, the

new Mark I-50 is said to be the ultimate in crane configuration for the complete domination of building sites. The tower can be extended to building height and boom length, and boom lengths from 60 to 120 ft. are available. It provides vertical and horizontal lifting ability in one continuous cycle, and under average conditions can pour up to 50 cu. yd. of concrete per hour. All four basic functions, swing, load hoist, boom hoist, and propel can be operated independently or simultaneously. Operator's cab inside the vertical tower can be raised or lowered to any desired height.

. . . Write No. 169

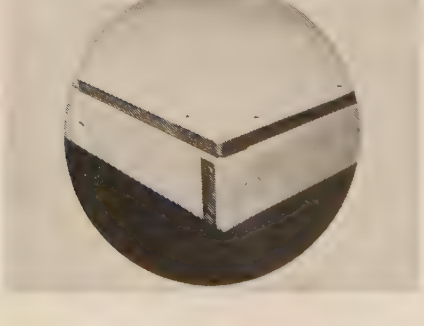
Telescoping crane has 5-ton capacity

The **Hanson Clutch & Machinery Co.** announces a new 5-ton capacity hydraulically operated telescoping crane designated Model H-5. The unit is powered by a Continental Model F-226 6-cylinder gasoline engine, and has a 4-speed transmission and Allison

torque converter as standard equipment. The boom swings in a 360-deg. arc and telescopes hydraulically from its 10-ft. basic length to 18 ft. All operations are independent and simultaneous. Tires are 9.00 x 20 10-ply with dual wheels on the front drive axle and single wheels on the rear steering axle. It has a top speed of 20 mi. mph., 4-wheel hydraulic brakes and hydraulic power steering are standard. Options include an operator's cab and hydraulic outriggers. ... *Write No. 170*

Metal-edged form panel

A lightweight panel system for concrete forming composed of plywood panels with metal edges and struts is announced by **Engineered Concrete Form Corp.** Panels are constructed with conventional lumber, reinforced with metal edging which prevents splintering of panels and increases their life up to twice that of ordinary wood forms. Panels are made in modules of 2 x 4, 2 x 6, and 2 x 8 ft. Panels are compatible with most wood form-

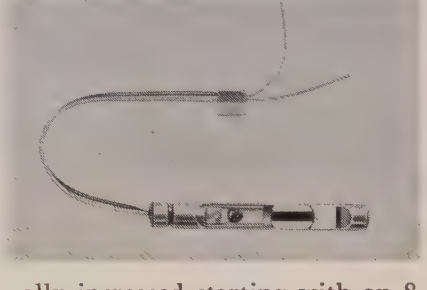


ing systems and require a minimum of hardware in erection. Weight is 1/3 less than steel panels. Cost is about 20% below steel systems and 45% below conventional wood systems.

... *Write No. 180*

Blasting system offers 38 delays

A total of 38 spaced shots in 3¼ sec. are offered in the new Rochester extended series of millisecond delay electric blasting caps announced by **Atlas Powder Co.** Developed for closely regulated blasting, particularly in congested areas, the new system permits shooting more rock in a single blast. Spacing of the individual shots is grad-



ually increased starting with an 8-millisecond delay and progressing to 25, 50, and 100, and 125 milliseconds. Total elapsed time for the entire 38 shot series is 3.257 sec. Advantages cited for this new system include higher blasts production, longer working time for drilling and earthmoving equipment, less downtime and fewer shots per day which the company says will minimize public relations problems on the job. ... *Write No. 181*

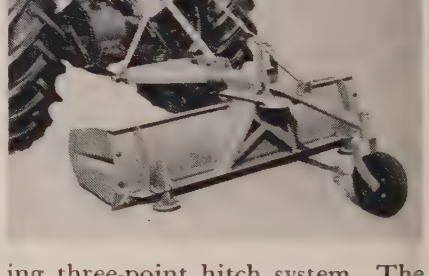
Mixer for lightweight concrete

A compact mobile mixer, especially designed for production of lightweight concrete for roof deck applications is announced by **Concrete Transport Mixer Co.** Unit has a built-in Moyno Pump which

permits it to receive ingredients at ground level and discharge mixed concrete through a height of 20 ft. and a horizontal distance of 250 ft. Features of the machine include hydraulic controls of bucket lift, bucket door, and discharge gate. Engine clutch levers and hydraulic valves are controlled from the operator's platform. Mixer and pump are each driven by a Wisconsin engine. Water control is by means of a Neptune Auto-Stop Meter. Production in excess of 1,100 sq. ft. per hour with a 5 man crew has been reported. ... *Write No. 182*

Grading attachments for wheel tractors

Interchangeable grader blade and rake for three-point hitch wheel tractors are announced by the **Arps Corp.** Designated Model AB-11 Thrift-Blade and Thrift-Rake, they are interchangeable on the same frame, and are designed for 1, 2, or 3 plow tractors employ-



ing three-point hitch system. The blade weighs 312 lb., measures 17 in. high, and 72 in. long, is carried on a heavy tubular frame. It has 10 angular positions including 3 in reverse, 3 leveling adjustments, and is reversed merely by lifting a locked pin and rotating the blade. A trailing gage wheel is offered for precise depth control. The rig attachment mounts on the same frame and is available in 6-ft. or 8-ft. lengths. Optional single or dual gate wheels are available with the rig to maintain constant depth on leveling jobs. ... *Write No. 183*

Hydraulic backhoe-loader attachment

A combination hydraulically-operated backhoe and front-end loader attachment for its 22-B crawler frames is announced by **Bucyrus-Erie Co.** Features of this unusual unit include a 15-ft. boom, a hydraulic cylinder which is a brake to hold down the boom, push-button, hydraulic powered wrist action for a 1½-yd. dipper 72 in. wide. The bucket is 84 in. wide with side cutters, has two cut-

ting edges with teeth for operation as a hoe or as a shovel-front end loader. In addition to capacity-boosting advantages the combination of boom hold-down pressure and trench-wide wrist action dipper, eases leveling and cleanout and relieves hand labor for other work.

. . . Write No. 184

Dual hitch dragline bucket

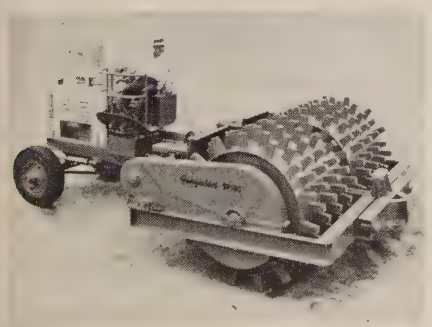
A dual hitch dragline bucket, which permits consistent digging at any depth above or below the

fairlead is announced by **Page Engineering Co.** The all-purpose bucket can be used with any type of dragline machine and is available in any size to meet the particular job requirements.

. . . Write No. 185

Self-propelled tamping roller

The Ferguson Model SP-120 self-propelled tamping roller incorporating two 5 x 5 drums linked to a front mounted diesel engine over a forward axle is announced by **Shovel Supply Co.** The unit is equipped with a GM-4-71 125 hp. diesel engine, Allison torque converter, and a final chain drive run-



ning in oil at the outer end of each drum. Empty, the roller exerts a bearing pressure of 372 psi., ballasted with water the pressure is 550 psi. The 3-speed transmission gives it speeds of 2, 4, and 8 mph. forward and reverse. All hydraulic and air controls are conveniently located at the operator's position. The machine is suitable for all types of heavy compaction and meets all state highway specifications. *. . . Write No. 186*

Trojan expands wheel loader line

The Model 114 wheel loader of 6,500-lb. lifting capacity has been added to the Trojan line of tractor shovels. The new unit, made by **Yale & Towne**, features power

shift transmission, planetary axles, power steering and vacuum-boosted hydraulic power brakes. It is available with buckets ranging from 1 to 1 2/3 cu. yd. and has a road speed of more than 25 mph. The new model has safety curve lift arms, long wheel base, and wide tread which are characteristic of the Trojan line. It is offered with either gasoline or diesel engine. *. . . Write No. 187*

Self-contained rig for heavy-duty drilling

A crawler-mounted drill rig which produces holes up to 6½ in. diameter and is completely self-contained including a 600-cfm. compressor is announced by **Schramm, Inc.** The Model C66 Crawler Rotadrill mounts all equipment necessary for drilling holes to the depths required in rock removal operations. The rig is designed for one-man operation with all controls for drilling and maneuvering located in the operator's cab on the work platform.

Features include a "Lazy Susan" rack mounted in the mast, which holds extra drill pipe ready to be swung under the drive sub and threaded as needed. The machine is completely powered by hydraulics. The top drive rotation head is powered by variable speed hydraulic motors which can be adjusted to specific drilling conditions. Crawlers have individual drives. Hydraulic rams in the mast can exert down pressure to 28,000 lb. The unit has a 600-cfm. compressor which operates at 100 psi. A choice of two masts with 25 to 35-ft. travel length is offered. *. . . Write No. 188*

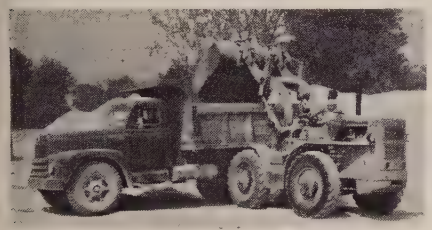
Diamond T announces big truck series

A group of diesel trucks offering a wide variety of accessory combinations and designed for heavy hauling work is announced by **Diamond T Motor Truck Co.** Designated series 931 these trucks have gross vehicle weight ratings up to 60,000 lb. and gross combi-

nation weight ratings up to 78,000 lb. The trucks are equipped with the "D" cab mounted 6 in. higher than other diesel cabs of the company's line for improved visibility. A choice of 6 diesel engines of 220 to 320 hp. is available. Two front axle positions are offered along with 11 main transmissions including a number which can be obtained with aluminum cases and 11 rear axle combinations. The 921 series is offered with single or tandem rear axles. A lightweight aluminum version is included in the series. *. . . Write No. 189*

Cat announces third loader model

The Model 922 of 80-net hp. and 1¼-cu. yd. bucket capacity is announced by **Caterpillar Tractor Co.** as the most recent in its line of wheel mounted Traxcavators. In overall design and configuration the new unit resembles the



two larger machines previously announced, the 944 of 105 hp. and the 966 with 140 hp. A prime feature of the 922 is its open and easily accessible operator's compartment and the location of all loader mechanisms completely ahead of the operator. The new model has a maximum lift capability of 12 ft. 2 in. and a dumping reach of 25¾ in. It has a breakout force of 13,700 lb. It is offered with diesel or gasoline engine. Power train includes a 2-speed power shift transmission, torque converter, auxiliary transmission and a planetary final drive. Four-wheel drive is used for working conditions and a 2-wheel drive is available for load travel. The 922 has a gross weight of 15,920 lb., a length of 16 ft. 5 in., and is 6 ft. 11¾ in. wide at the bucket. It has a top speed of 19 mi. per hour forward and 24 mi. per hour in reverse.

. . . Write No. 190

HOST DIRECTORS at the Sun Valley conference were, from left, W. H. Cornelius, Region 14; C. E. Skidmore, Region 11; and Jack Hatten, Region 12.

Distributors air problems at AED management meet

Over-abundance of practically everything but money characterized the management problems reviewed by more than 100 top distributor executives at the 1960 Management Conference held Oct. 5-7 at Sun Valley under sponsorship of Associated Equipment Distributors.

Among the "surplus" items discussed were: Too many lines of equipment and too many routine duties handled by upper eschelon management, along with the chronic categories of too much iron owned at too high prices, and too much outstanding credit of doubtful worth.

Shortages also were discussed, with net profit (1.41% in 1959) heading the list. Other leading items listed in short supply were proper delegation of authority and detailed management planning.

The two-day shirt-sleeve conference was conducted by a traveling team of speakers headed by National President Herbert J. Mayer, Western Machinery Co., San Francisco, and including H. D. Anderson, Rish Equipment Co., Bluefield, W. Va.; John W. Schoen, Contractors Equipment & Supply Co., Albuquerque; J. K. Wheeler, Wheeler Machinery Co., Salt Lake City; W. J. E. Crissy, Personnel Development Associates, New York City; and L. J. Taylor, Hillsdale College, Hillsdale, Mich. This group also conducted three other meetings in AED's nation-wide series of conferences.

The formal conference program was augmented by a number of informal workshop meetings directed by distributor members. Discussion leaders and their subjects were: Leigh M. Jones, Western Machinery Co., Denver—used equipment; I. R. Kramer, Buran Equipment Co., Santa Clara — warranty costs; A. Aldecoa, Intermountain Equipment Co., Boise — rental-purchase D. E. Hughes, Cate Equipment Co., Salt Lake City—legal aspects; J. D. Coggins, J. D. Coggins Co., Albuquerque—credit; and Ben A. Seller, Salina Tractor Co., Salina, Kans.—communications.

Methods of evaluating equipment lines, currently handled or considered for addition were reviewed by H. D. Anderson, who listed these factors:

Finances — amount of money available for investment in the line, or the amount of capital which would be freed for more profitable investment if the line were dropped. He noted that a dealer frequently can make more money by dropping slow moving lines and using the capital thus gained to help finance faster selling items.

Geography — are there enough prospective customers in the trade area to justify handling the line. The speaker noted that the more thinly populated the trade territory, the more lines must be handled to produce the necessary sales volume for profitable operation.

Type of business—does the item fit into your type of business. For example, a strictly industrial product should be handled by a heavy construction distributor.

Sales evaluation of the product covers these points: potential sales volume, amount of time required by salesmen in studying product as well as selling, profit margin, trade-ins expected and their potential re-sale, parts inventory and service required, advertising and promotion costs.

Anderson cautioned that most firms carry too many lines and

(Continued on page 108)

PRESIDENT and Mrs. H. J. Mayer receive a set of crystal from Al Garlinghouse on behalf of Region 11.

Conference Quotes

"The best way to double your money is to fold it in half and put it in your pocket."

* * *

Asked if it were necessary for a businessman to make a profit, 57% of a high school senior class said no.

* * *

Bad: Spend $500 on a $50 problem.
Worse: Spend $50 on a $500 problem.

* * *

"Call a meeting when you are confused and you just spread the confusion."

* * *

When a sales manager reported that he wanted to fire a new salesman because "the guy's a bum," the boss asked him three questions: Who hired him? Who trained him? Who's a bum?

* * *

"We need two platoons of salesmen, one to sell and one to attend meetings."

Over grueling mountain roads, WHITE 9064s haul hefty 8 yd. payloads on a 16 hour day marathon for Dillon, Montana's Tri-State Minerals Co.

Trucks that operate through Montana winters leave little question as to their true quality! For here, at low temperatures and high elevations, *quality quickly shows up!*

The Tri-State Minerals Co. in Dillon works its mining operation twelve months a year, and therefore requires trucks capable of matching this challenging program. That means *quality* trucks, and Tri-State depends on White 9064s to do the job!

If you examine this vehicle, you'll see the quality difference. Every White built is custom-engineered to do a specific job; thus, the ideal combination of axles, engine, transmission and every other component is brought together to form a vehicle that promises to do the job best at least cost to its operator. Throughout the truck top quality is maintained and the product is a full-time, all-year worker that pays its way from the very first... a protected investment!

Match White's advantages against *your* hauling program and you'll see where you can save money. Get the facts from your local White representative now!

THE WHITE MOTOR COMPANY, CLEVELAND 1, OHIO

Factory Branches, Distributors, Dealers in all Principal Cities

WORLD LEADER IN HEAVY DUTY TRUCKS ...60 YEARS OF LEADERSHIP

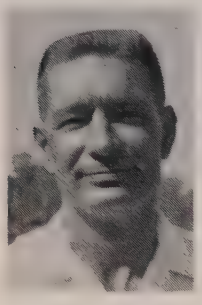
WHITE

. . . for more details, write No. 51 on Reader Service Postcard

News of DISTRIBUTORS

Personnel realignment by Lively

W. R. Lancaster has been appointed sales manager for Lively Equipment Co., Albuquerque, N. Mex. Lancaster joined Lively in July after serving with the Euclid dealership in Billings, Mont., for fourteen years. He succeeds Cecil Terrel who will concentrate on used equipment sales.



W. R. Lancaster

Moxon named sales representative

Moxon Electronics Corp., Beverly Hills, Calif., has been appointed an exclusive sales representative for Detectron underground pipe detectors by the manufacturer, Computer Measurements Co. Moxon's industrial division will be responsible for the promotion, sale and service of the complete Detectron line used by pipeline contractors, industry, and municipalities, from Los Angeles to the Oregon border.

N C Co Alaskan expansion

Truman Sage, general sales manager for the Machinery Division of Northern Commercial Co., Caterpillar distributor, announces a new building at Anchorage for installation of track, roller, idler and sprocket rebuilding facilities. The new building, located 4 mi. south of Anchorage, houses a new automatic rebuilding machine for rollers and idlers. A new track rebuilding machine automatically rebuilds worn rails to original size.

Northern California appointment

Appointment of a new distributorship in San Francisco is part of an expanded national distribution program by Chem Seal Corp. Conrad Sovig Co. will distribute in this area such products as epoxy coatings, adhesives and sealants produced by the Los Angeles manufacturing firm.

Waco given Kwik-Mix line

Waco Scaffold & Equipment Co., Portland, has been appointed a distributor by the Kwik-Mix Co. Territory assigned to Waco is the state of Oregon and the southwestern corner of Washington.

Parsons names Shawnee distributor

Dal-Tex Equipment Co., Dallas, Tex., has been appointed a distributor to handle Parsons-Shawnee products of the Parsons Company,

manufacturers of trenching machines. Parsons is a division of Koehring Co. In the area assigned to Dal-Tex is included the state of New Mexico.

Preco names Fornaciari

Appointment of the Fornaciari Company as a distributor for the Los Angeles area is announced by Bob Nichols, sales manager of Preco Inc., manufacturer of Preco back rippers.

Atlas Scaffold takes on two lines

Atlas Scaffold & Equipment Co., Fresno, Calif., has been appointed a distributor for Superior Concrete Accessories, Inc., and also for the National Expansion Joint Co. Complete stocks of these manufacturers' products are being warehoused by Atlas, according to Larry Victor, Atlas manager.

Peerless expansion

Peerless Trailer Co. of Portland, Ore., has added a completely new parts department and shipping department. Covering an area of 4,800 sq. ft., this section is located at 516 N. E. Second Ave. With the new building, Peerless is in a position to increase its parts inventory and add to the efficiency of the department in customer service. Also, another 6,000 sq. ft. of trailer shop space, four new manufacturing bays have been added, and the latest in hoists, welding, and other equipment.

Bacon appoints district manager

E. J. Brizz is Edward R. Bacon Co.'s new district manager at Sacramento, Calif. He replaces N. B. Denney.

Quinn Co. appoints Ed Allen

E. G. Allen is the new manager at the Quinn Company (formerly Budd & Quinn, Inc.), Firebaugh, Calif., replacing Dave Troup.

Robert Bartlett succeeds Olds

H. A. Olds recently retired as sales manager of Spears-Wells Machinery Co., Oakland, Calif. Robert Bartlett has succeeded him.

To better service its customers

On November 1 Inland Machinery Co.'s branch store located at Enterprise, Ore., is moving to the Harris Pine Mills Shop located in Joseph, Ore. The move is occasioned by inadequate shop space at the former location. The new branch has three 20 x 60-ft. work bays plus a 3-ton capacity overhead crane.

Personnel changes; new lines

In key positions serving under Robert E. Pierre, new general manager of Cook Bros. Truck & Equipment Co., Oakland, are the following: J. W. Plummer, administrative assistant; R. W. Parsons, manager—Construction Equipment Division; and W. Holloway, manager—Truck Division. This distributor recently took on several new lines: Davis trenchers, Buffalo-Springfield rollers; Ko-Cal projects; Ka-Mo tools, Kwik-Mix mixers, and Reo trucks, as well as the Vulcan pile hammer.

Peterson extends Cat territory

Peterson Tractor Co., San Francisco Bay area Caterpillar dealer, has expanded its territory to include Santa Clara County. Howard Peterson, president of the San Leandro firm, said that the change was made possible when Ditz

Bros. of Santa Clara relinquished its Caterpillar franchise. The remainder of the Ditz territory consisting of San Benito County has become part of the Pringle Tractor Co. dealership.

Sales policy change

Master Power Corp., a Black & Decker subsidiary and manufacturer of portable air tools, has made a change in its sales policy affecting the Southern California area, and appointed four distributors, all located in the city of Los Angeles: Frey Industrial Supply Co., Union Hardware & Metal Co., Machinists Tool & Supply Co., and Barker Foundry Supply Co. Heretofore, Master Power's products were handled directly by the company's own salesmen. Working closely with the newly appointed distributors will be Granville E. Pike, factory representative.

Cummins delivers

Cummins Colorado Inc., Denver, locally owned Colorado distributor for Cummins engines, recently delivered the first V-8 Turbodiesel Cummins engine for high altitude construction application.

MANUFACTURERS

T. L. Smith adds product line

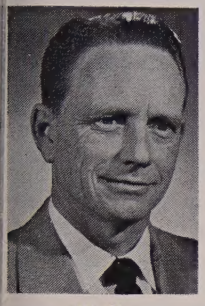
The T. L. Smith Co., Milwaukee manufacturer, announces the acquisition of a subsidiary: The L. O. Gregory Manufacturing Co., Inc., Memphis, Tenn. This, according to Robert W. Smith, president of the Smith company, is the first in a series of planned moves to diversify sales. Gregory has been a leading supplier of batching equipment to contractors, ready mix and concrete products markets. L. O. Gregory, head of the firm, will continue with Smith as sales manager of the subsidiary.

Soule' marks 50th year

Launching its golden anniversary, officials of Soule' Steel Co. in San Francisco recently met to welcome district sales managers from all parts of the West, and to pay honor to a group of pioneer employees. Soule' was one of the West's earliest distributors of reinforcing steel for construction, and has expanded into other additional building products lines, now occupying seven plants throughout the West.

A-C reorganizes sales structure

In order to effect a closer relationship among customers, dealers and the company, Allis-Chalmers Manufacturing Co. has organized on a national basis six sales regions within the construction machinery



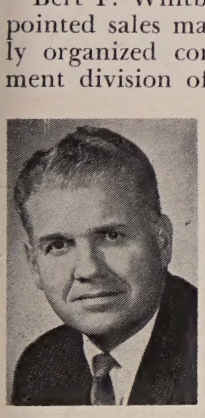
Haile

Skinner

division. H. T. Larmore was appointed to the newly made position of general products manager of the division. As part of the move, John M. Haile was appointed manager of the Northwest sales region, and J. T. Skinner of the Western region. Both men will headquarter in Milwaukee.

Whitbread heads contruction equipment division

Bert F. Whitbread has been appointed sales manager of the newly organized construction equipment division of Minneapolis-Moline Co. M. E. Carroll, vice president – marketing, explained that major expansion of the Moline line and broadened marketing activity brought about the separation of construction equipment sales from power equipment sales. The two organizations replace the former industrial sales division. Whitbread has 25 years experience in construction equipment sales and service.



Bert F. Whitbread

Arnold named Parsons president

J. W. Arnold has been appointed president and general manager of the Parsons Company, manufacturer of trenching machines. Parsons is a division of Koehring Co. Arnold was vice president in charge of manufacturing for the Hydraulic Press Manufacturing Co., another Koehring division, before coming to Parsons last April.

Tise named chief engineer

William R. Tise has been named chief engineer for conveyor products sales by United States Rubber Co. He has been West Coast sales engineer for the department, headquartering in Los Angeles. He will now operate out of the company's Passaic, N. J., plant.

J. I. Case engineering promotion

Appointment of Carl vonLinsowe as director of engineering—industrial products for J. I. Case Co. is announced. For the past three years, vonLinsowe has been manager of engineering of the Churubusco, Inc., Works, at which plant Case produces its larger line of crawler tractors.

Western District USS promotions

Howard M. Wiley, headquartered in Berkeley, Calif., since 1947, has been promoted to manager of construction for U. S. Steel's Consolidated Western Steel Division at Los Angeles. He succeeds Barclay C. Knerr, who has retired after 38 years in the construction field. Stanley R. Farwell succeeds to Wiley's former post as superintendent of the Northern construction area with offices in Berkeley.

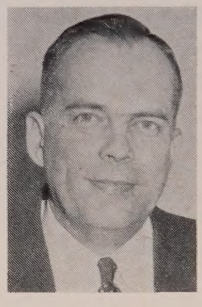
Koehring equipment show

An attendance upwards of 2,000 contractors and other equipment users is expected at Koehring Company's 1960 Construction Equipment Show, Sept. 19-23 at the company's proving grounds near Waukesha, Wis. More than forty pieces

of construction equipment will be displayed including the newest developments in excavators, cranes, hauling and paving equipment, spreaders, rollers and other units for all phases of construction.

Two to top sales posts

Cummins Engine Co., Inc., announces the promotion of C. R. Boll and R. W. Franck to top sales posts: Boll to the new position of executive vice president — marketing, and Franck, vice president — sales. During his fourteen years



Boll

Franck

with Cummins, Boll progressively held important posts, most recently that of vice president—sales. Franck joined Cummins in 1948, and likewise has served in several important positions, advancing to his most recent post as director—field sales.

Appointments by Caterpillar

Appointment of Charles B. Leber to advertising manager of Caterpillar Tractor Co. is announced. He succeeds Burt M. Powell, who has held the post since 1953 and is now retiring. Frank S. Foster succeeds Leber as manager of the sales division of the defense products department.

New product development head

Andrew C. Thomas has been elected vice president in charge of new product development by The Jaeger Machine Co., manufacturer of truck mixers, concrete mixers, compressors, and other contractor equipment.

Essick acquires Superior

After a year as distributor of Superior cement finishers under the name of Essick-Superior, Bryant Essick, president of Essick Manufacturing Co., announces the acquisition of the Superior Cement Tool Corp. of Lynwood, Calif. Essick-Superior manufacturing facilities will be moved to Essick's home office and plant.

Sun Valley

(Continued from page 102)

salesmen do not have enough time to cover them adequately. He observed that salesmen actually spend a relatively small amount of their time in the field—since an increasingly large portion goes to meetings, factory training schools, writing reports, etc.

Three primary sins of management listed by Dr. Walter Crissy in his presentation on analyzing the distributor management job were: indecisiveness on the part of the chief executive, failure to delegate authority, and failure to make and carry out proper plans for conduct of the business.

Crissy pointed out that everyone is familiar with the boss who delays making a decision. This trait is deadly, he said. To his subordinates, failure to make a decision is in itself a decision — he's decided not to decide. On that basis the business goes off in all directions.

While most business executives tend to think they delegate authority, they often are kidding themselves because their employees don't believe they have the authority to act. Result — everything is cleared with the boss, and he is buried in routine details of the business.

Crissy recommended that managers clearly define the authority to act which is delegated to each level of company management and require accountability at each level commensurate with this authority. Further, he noted, this should be clearly understood by both the boss and his subordinates.

Host directors at the conference were C. E. Skidmore, Brown-Bevis Industrial Equipment Co., Los Angeles, of Region 11; J. T. Hatten, Hatten Machinery Co., Seattle, Wash., Region 12; and W. H. Cornelius, The Cornelius Co., Albuquerque, Region 14.

At the buffet dinner which highlighted social activities of the conference, President and Mrs. Mayer were given a set of Steuben crystal by members of Region 11 in recognition of Mayer's years of service to AED and the industry. Presentation was made by Al Garlinghouse, former national president, of Los Angeles.

Arrangements for the conference were handled by AED staff members Frank Skidmore, P. D. Hermann, W. G. Bowman, and E. H. Hasemann.

More time for outside interests

Announcement is made by E. Don Tull, president of Cummins Engine Co., Inc., that D. J. Cummins, vice president—engineering, is taking a leave of absence from the company after forty years of service. He will continue to serve in a consulting capacity. Cummins has been with the firm since its inception in 1919, and has held many important positions during the interim. Now he intends to devote more time to his various outside interests.

Challenge-Cook to make and distribute Straddle Trailer

Challenge-Cook Bros., Inc., Los Angeles, manufacturer of hauling equipment and machinery, announces the acquisition and exclusive manufacturing and distributing rights for the Straddle Trailer. The Straddle Trailer is a "one-man method" of material handling. It has its own hydraulic system, picks up the load, holds it secure while traveling, and unloads at the job site. The trailer can haul up to 40,000-lb. payloads.

To head West Coast operation

American Pecco Corp. announces that Kenneth L. Hazelton has been appointed to head the firm's new West Coast operation. Hazelton's duties will include not only running the West Coast headquarters at 439 South Canal St., South San Francisco, Calif., but also heading up Pecco sales and service for the thirteen Western states, including Alaska and Hawaii. Before his present assignment, Hazelton was vice president and general manager for Beatty Scaffold, Inc.

White changes West Coast region name

The White Motor Co.'s Pacific Coast Region is now officially known as the Western Region, according to announcement by Wilson D. Patterson, regional vice president of the heavy-duty truck manufacturer. The geographic boundaries of the region embodying over 2,000,000 sq. mi. in the West remains unchanged. Patterson's regional office is in San Francisco and his new title is "Regional Vice president of the Western region."

Koehring equipment show

Some two thousand persons attended Koehring Company's 1960 Construction Equipment Show at the company's proving grounds recently. Construction machines numbering about forty, built by various divisions of Koehring, formed the equipment spread and were put through their paces in a variety of demonstrations. Among feature attractions was a complete highway paving set-up, which included the world's largest paver, the Tribatch.

ESCO adopts new name

ESCO Corporation is the new name for the 47-year old Portland, Ore., firm formerly known as Electric Steel Foundry Co. The change has been under consideration for some time, ever since the company's expansion into fields other than foundry. Since the company's products have been marketed for many years under the name of ESCO, the choice of the new title was not difficult.

R. C. Valore joins Sika

Rudolph C. Valore, Jr., has joined Sika Chemical Corp. as director of research. He fills the post vacated by Ray Schutz who was promoted to vice president for research and development last January.

B-G and Telsmith combine service

Barber-Greene Co. announces that its San Francisco branch office, 320 Victory Ave., South San Francisco, Calif., will now handle both Barber-Greene and Telsmith products. William F. Taylor, who represented the Telsmith account in California for several years, will be branch sales manager for Telsmith in Northern California, under Marshall C. Ham, branch manager.

A-C engineering appointments

Two engineering appointments are announced by Allis-Chalmers Mfg. Co. Walter F. Strehlow has been named senior consulting engineer for the Tractor Group. He had been chief engineer at the West Allis, Wis., tractor works.

Regional sales manager named

Announcement is made by American Road Equipment Co., Omaha, Neb., of a new Western area representative. New regional sales manager is George Smith of Salt Lake City, Utah, who has had more than twenty years experience in the construction equipment field.

Barclay Knerr retires from USS

After 38 years in the construction field during which he had charge of steel erection for structures which have become Western landmarks, Barclay C. Knerr has retired as manager of construction for U. S. Steel's Consolidated Western Steel Division. The promotion of Howard M. Wiley, construction superintendent of the Northern area, to succeed Knerr is also announced, as well as the advancement of Stanley R. Farwell, Los Angeles district construction superintendent, to Wiley's previous post.

B-E elects Eugene P. Berg

Eugene P. Berg was recently elected as executive vice president of Bucyrus-Erie Co. He had previously been with Link-Belt Co. since 1937.

ADVERTISERS in this issue