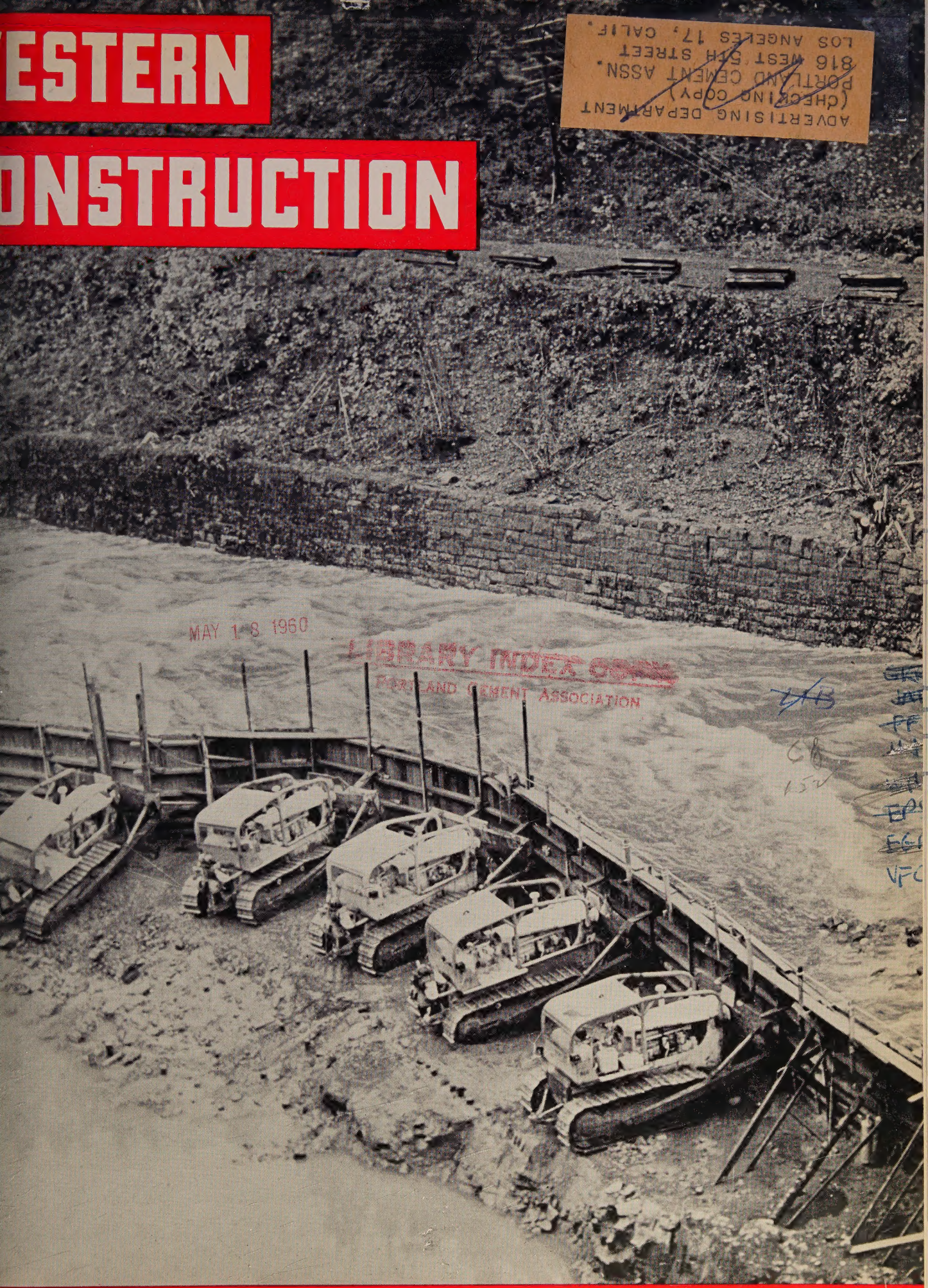
ESTERN
ONSTRUCTION

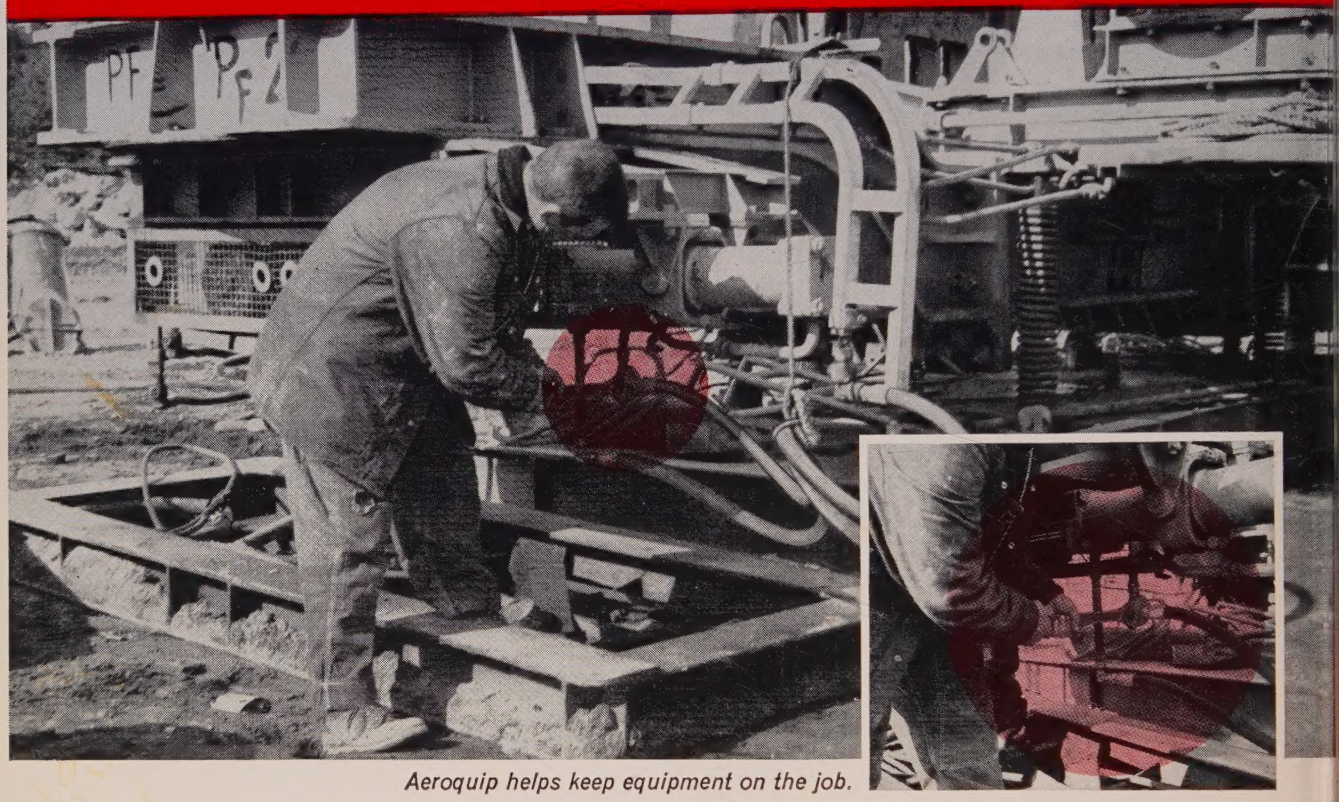


Holding the Flood at Hanson Dam

MAY 1960

walking pile driver has up to 8000 psi peak hydraulic pressures handled by Aeroquip Very High Pressure Hose

...from job report, Franki Foundation Co., Boston, Mass.



Aeroquip helps keep equipment on the job.

Hydraulic pressure is the key to walking Franki's 70-ton rig onto a foundation job. Frequently, the hydraulic pressure hits 7000 to 8000 psi—only the best hose can take this kind of punishment. Aeroquip 1508 Spiral Wrap Reinforced Hose is meeting this extreme test without break or trace of leak. The pictures show a Franki rig on one of the 140 caissons required for a new department store at the New England Shopping Center, Saugus, Mass. Franki is also using Aeroquip Low Pressure Hose for air lines on his construction equipment.

Our files of job reports like this show you are in good hands when you consult with Aeroquip. You'll find details about the right kind of Aeroquip Hose and Reusable Fittings for your particular applications in Catalog 204. Your Aeroquip distributor, a fluid line specialist, will give you a copy. He'll discuss, without obligation, various applications that might be helpful to you. His number is in the "Yellow Pages" under "Hose."

Aeroquip is so easy to use—inventory's just a few feet of hose and a handful of fittings.

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REG. TRADEMARK

AEROQUIP CORPORATION, WESTERN DIVISION, BURBANK, CALIFORNIA

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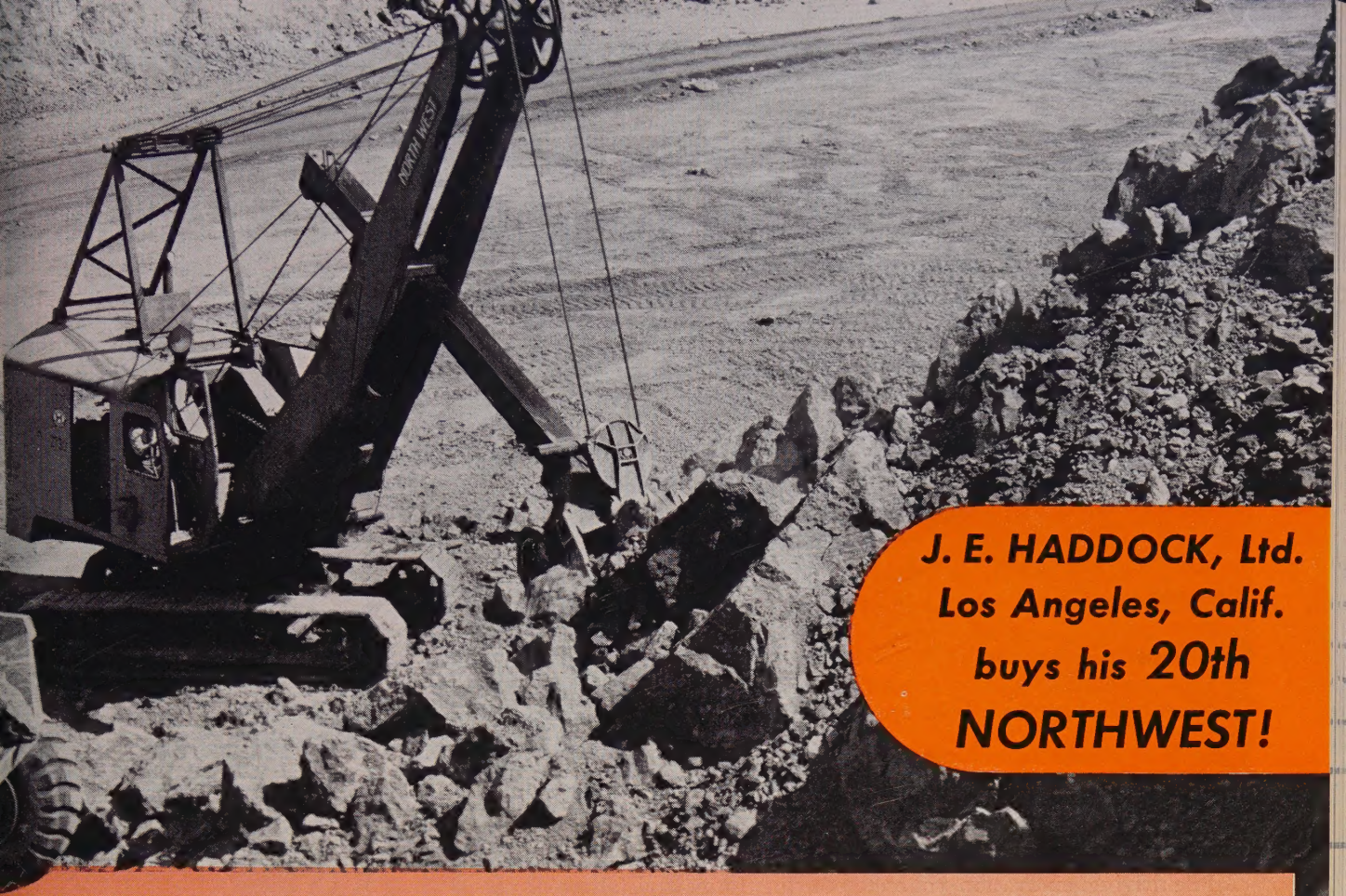

J. E. HADDOCK, Ltd.
Los Angeles, Calif.
buys his 20th
NORTHWEST!

REPEAT ORDERS are born on Jobs like this!

EXPERIENCE with a piece of equipment is the greatest sales influence there is. The picture shows an early Northwest 80-D shovel that J. E. Haddock, Ltd. used on the tough Conjeo grade section of Route 101 near Newbury Park, California. Though a rocky, messy job, good management and four Northwests kept the job on schedule. The experience of the Haddock organization with Northwest equipment of practically every type and capacity goes back years. Repeat orders are born on jobs like this!

The purchase of another Northwest machine can be ascribed to the high degree of Northwest performance, dependability and low cost of operation.

Shovel operation is not measured by the speed of a hoist rope or the number of revolutions per minute. Shovel production is the result of maintained steady month in and month out operation. They are built for the toughest job a shovel has to do. Your Northwest is a real Rock Shovel. The Northwest Dual Independent Crowd that utilizes force most independent crowd shovels waste, combines with the ease of operation that comes with the Feather-Touch Clutch Control, the safety advantages that come with the Cushion Clutch, the smoothness of Uniform Pressure Swing Clutches, the easy mobility of Northwest Crawlers and other Northwest advantages to assure greater output in any kind of digging.

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OREGON: Cal-Ore Machinery Co., Inc., PORTLAND
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WESTERN CONSTRUCTION

KING PUBLICATION

MAY
1960
Vol. 35 No. 5

CONTENTS

COVER—Floods plagued construction work this winter at Howard Hanson Dam, a Corps of Engineers project near Seattle, Wash. Photo shows tractors supporting incompleted bulkhead protecting outlet works excavation. Record flood in following month topped barrier by 4 ft. Job story starts on page 49.

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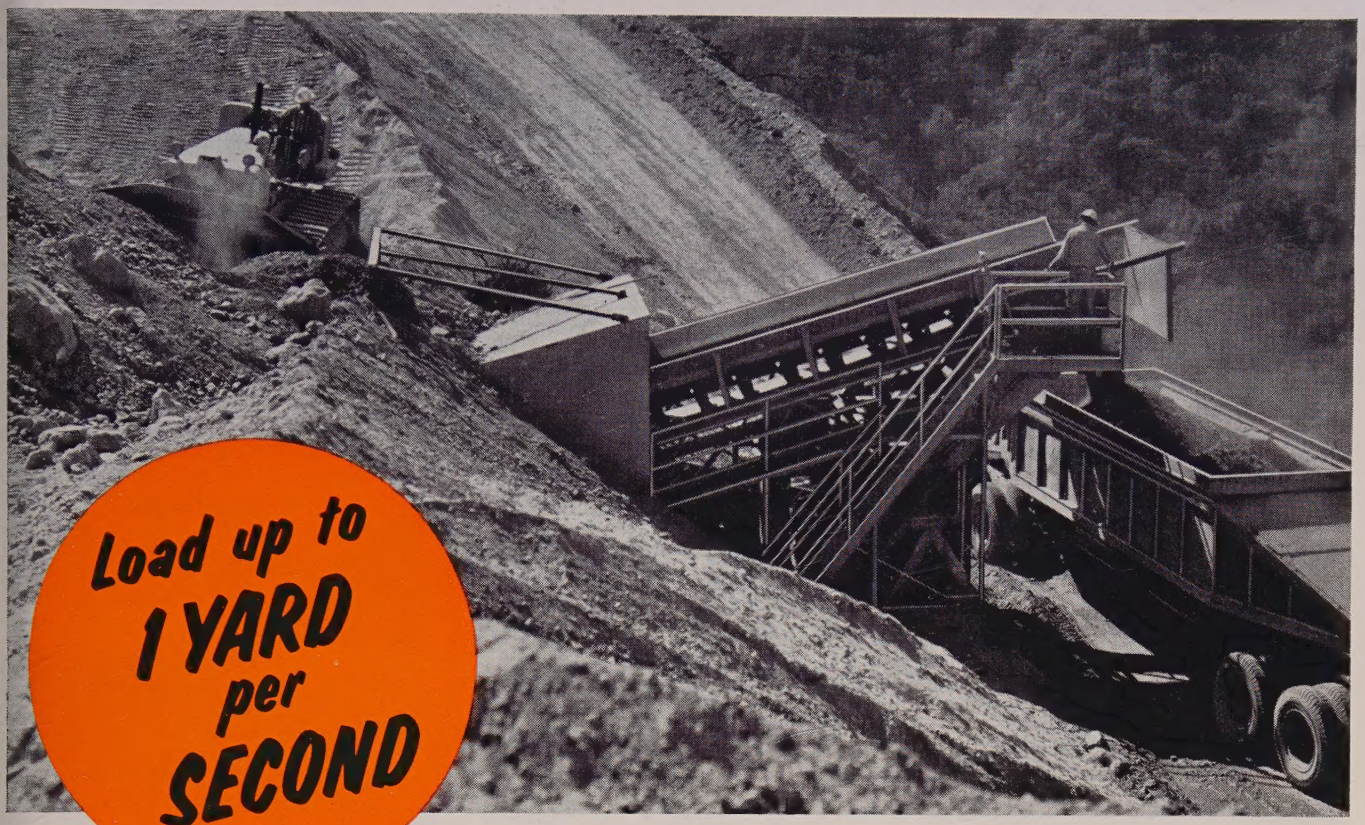

Load up to 1 YARD per SECOND

with KO-CAL Pitloader

That's right! 60-inch-wide conveyor belt on new KO-CAL™ Pitloader feeds materials from hopper to truck at speeds up to 1 cubic yard *per second.* High production for one-man loader operation! What's more, operator has full control of material-flow at all times . . . instantly regulates rate of feed while belt is in motion.

3 sizes in Pitloader line: 60-inch (above), 42 and 36-inch belt widths . . . each model ready-to-operate . . . quickly set up anywhere on job, easily moved. No complicated assembly, dismantling . . . no special foundation or footings necessary. In fact, rugged construction permits skidding Pitloader intact for short, on-the-job moves. Next time you have a dirt, sand, gravel, crushed-rock loading problem, check the time-saving convenience, economy, and high production capacity of a KO-CAL Pitloader. Why not phone or write us today?

Ready for the road in minutes

Pitloader has plenty of "pick-up-and-go" for job-to-job travel. 36 and 42-inch models mounted on rubber tires, fit legal highway limits. Just remove operator platform, hook up to truck and go! Couples to any truck tractor with 7-foot 6-inch cab-to-kingpin dimension. Low center of gravity assures safe travel. Ready to work on arrival!

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KOEHRING KO-CAL of California

Stockton, California
(Division of Koehring Co.)

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NEW EQUIPMENT

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

A truck that climbs over obstacles

Designed to bend in the middle and capable of climbing over a 3-ft. wall, **Clark Equipment Co.** is testing a truck that was originally designed by a Swiss firm. Called the Flex-Trac, the truck will handle a 45-deg. side slope, move across a river, traverse mud, sand, and snow, and at the same time develop a 56-mph. speed on the highway.

It was originally designed as a cargo or personnel carrier for terrain that was particularly severe. Its ability to climb walls comes from its articulated construction which permits any one of its three pairs of wheels—all of which drive—to be raised off the ground. This articulation is controlled hydraulically so that the vehicle can be placed in a swayback position with front and rear higher than the center, or can be moved into an arched position with the center wheels off the ground. In either of these positions, the truck can be held at an angle from about 30 deg. When the hydraulic control valve is set in a neutral or float position, the truck articulates freely allowing all six wheels to maintain contact. During a test at the Clark demonstration, the vehicle crossed a concrete wall 3 ft. high and 3 ft. wide in 15 sec. (see picture).

The braking arrangement provides a special steering feature. Braking action can be applied to all wheels simultaneously by the usual brake pedal or to left or right wheels separately through two brake levers. Thus, the machine, steers in a manner similar to those mounted on tracks. It is also possible to pivot the truck in its own length by raising the front and rear wheels and then applying the brake on either side at the middle wheel. These features develop from a radical frame design. The basic frame which supports the truck consists of the two center wheels mounted on an axle with a conventional differential at the center. On either side of the axle are pairs of arms which pivot about the axis. One of each pair of arms extends forward and one rearward. These arms are actually roller chain housing and the front and rear wheels are mounted on these arms. Thus, each front and rear wheel pivots up and down from the center axis.

In normal driving, left wheels rotate together and right wheels rotate together, with the left center wheel driven directly by the axle shaft and the front and rear wheels driven indirectly through the chains.

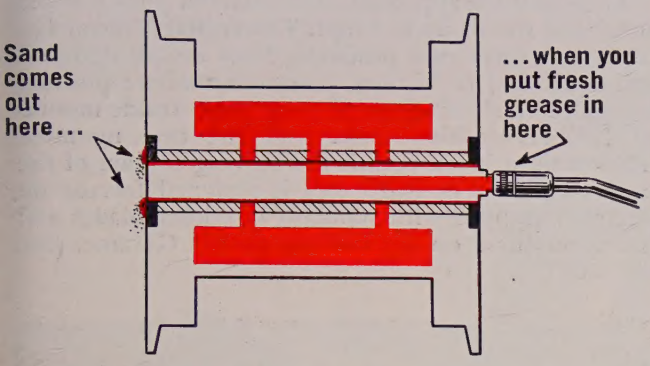
The body of the unit is divided with the front end containing the operator's compartment and power train from engine to center axle. The rear part of the body carries the payload and both bodies are supported independently of the truck frame. Both of these bodies are supported independently of the truck frame through four hydraulic cylinders, one connected to each of the front and rear wheels.

For amphibious operations, two removable propellors are attached and engaged with a power take-off on the transmission and direction is controlled by front wheel steering.

Clark is evaluating the unit at its Battle Creek test

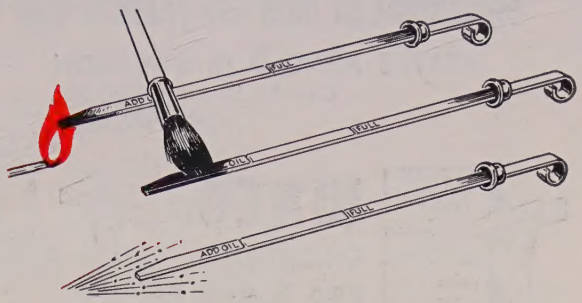
(Continued on page 16)

efficient maintenance



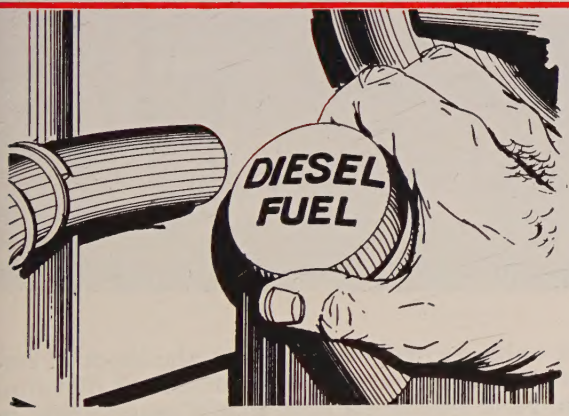
Track-roll enemy No. 1: sand

f you're operating a crawler-tractor in sandy soil, the best vay to keep sand from getting into the track-roll bearings s to keep purging the bearings with fresh grease. Track-roll earing seals are especially designed for this type of purge-ubrication, and the grease that comes out around the edges f the seal during lubrication carries the sand out with it.



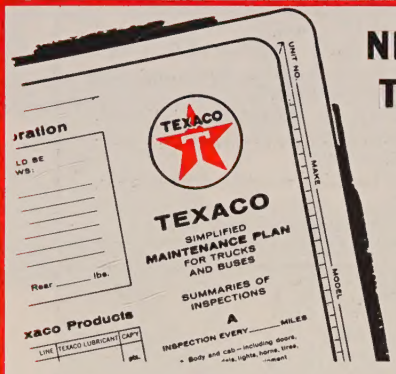
How to read dipsticks without squinting

The modern inhibited motor oil that keeps the inside of your engine clean also keeps the oil dipstick clean—and often too shiny to read. Here are three solutions for this problem—take your choice. 1. Heat the end of the dipstick so the metal darkens slightly. 2. Paint the end of the stick with a dull-finish cellulose lacquer. 3. Run the stick across the spark-plug cleaner to take off some of the shine. (If you use the spark plug cleaner, use the smallest rubber plug bushing and hold the dipstick over the hole with a wad of cloth to keep sand from scattering around the lube bay.)



Identify the fuel you want

et one absent-minded maintenance man put gasoline in our diesel tank and as the fliers say "you'll be bailing out ver Denver." It's happened. Best way to avoid its happen-ng to *you* is to mark your fill cap "Diesel Fuel" or Gasoline". Then nobody should make any mistakes.



NEW TRUCK RECORD FOLDER fits itself into your schedule

Texaco's flexible new truck record folder lets you stick to the lube schedule that works best for you without running into bookkeeping problems. Lubrication and oil schedules are completely separate from mechanical maintenance and replacement parts schedule—you don't have to follow any pre-established routine to use the folder profitably. And this new folder accounts for every single dollar you spend on truck maintenance for a whole year. Write for your folders today.

TEXACO LUBRICATION ENGINEERS

Every month we'll bring you a batch of "sleepers", little angles, so easy to overlook, where big savings in money and time can be made. But month in, month out, your local Texaco Lubrication Engineer is the best source of money-saving lubrication ideas. Don't forget that "Lubrication is a major factor in cost control."

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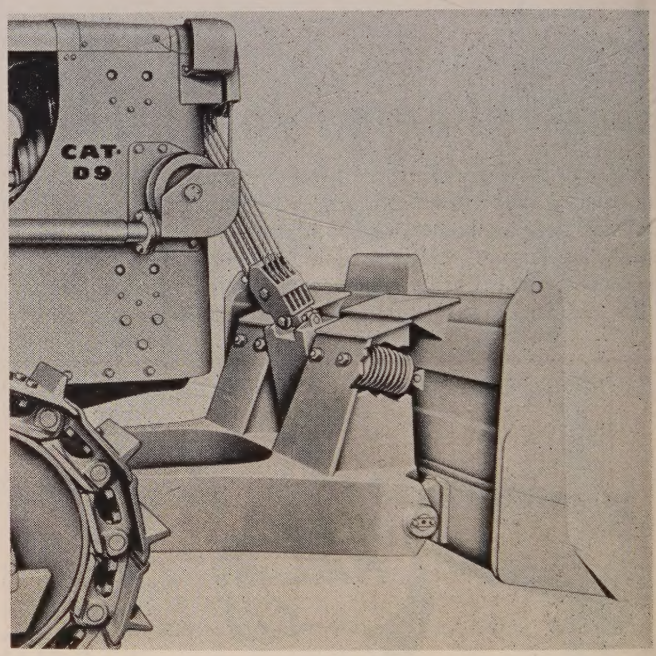
ing ground. One of the machines under test is of 1-ton capacity with a wheel base of 86 in. and the other has a 2-ton capacity. These tests will determine the suitability of the unit for construction work and other operations on rough terrain.

. . . Write No. 150

Shock absorbers for Cat pushers

To permit the approach and contact of push tractors at relative speeds up to 3 mph. **Caterpillar Tractor Co.** announces three new products. They are all designed and developed to increase production where pushing is required and to reduce pit-cycle time. Inside mounted No. 9C cushion dozer and the case mounted cushion push block permit the moving contact of the push tractors. The third tool is designed for use on tractors equipped with standard bulldozer blades and is rear-mounted on the tandem pusher C-frame. (See picture).



The units are designed to absorb the shock of contact with scrappers at higher than normal operating speeds. Field studies indicate that a considerable increase in production can be secured by making contact at these higher speeds. Cushioning of the No. 9C cushion dozer is accomplished with four rubber springs each made up of eight rubber discs. These springs are assembled with a preload of 7,200 lb. and will compress to handle a load of 93,000 lb. before bottoming. The dozer is mounted to heavy-duty push arms through a connecting box section and are welded to a heavy-duty crank case guard.

. . . Write No. 151

New tractor shovel by Hough

With a designation Model H-30 and an operating capacity of 3,000 lb., **Frank G. Hough Co.** announces an entirely new tractor-shovel. The size and type of Model H-30 has never before been available in the Payloader line. The unit has a 4-wheel drive with full power-shift transmission with matched torque-converter. It has 3 speeds in each direction and all shifts can be made "on-the-go."

Tougher than ever!

New ATECO HR-C6 ripper for Euclid C6 — ripper weight balances dozer for better traction added work power.

All-New ATECO ROCK RIPPERS FOR 1960

Built by the pioneer in the mounted ripper field, all-new ATECO Rock Rippers for 1960 are the masterpieces of 40 years' experience.

ATECO rippers on thousands of jobs throughout the U.S. and 43 foreign countries have proved ATECO's superior performance—licking tough jobs other rippers can't touch, **staying** on the job to keep scraper fleets rolling.

Today's ATECO ripper offers more than ever—bigger cylinders and rods, greater use of high-strength heat treated alloy steels, "beefed up" design at every point to give **extra** strength and dependability.

Only ATECO rippers offer the advantages of really big equipment—better performance from the start, superior performance with less downtime through the years. Why settle for less? There are 36 ATECO models available to match all popular big crawlers. Write or wire **now** for complete information—please address Dept. 112.

61

American

TRACTOR EQUIPMENT

Corporation

Designers and Manufacturers Since 1920

9131 SAN LEANDRO BOULEVARD • OAKLAND 3, CALIFORNIA

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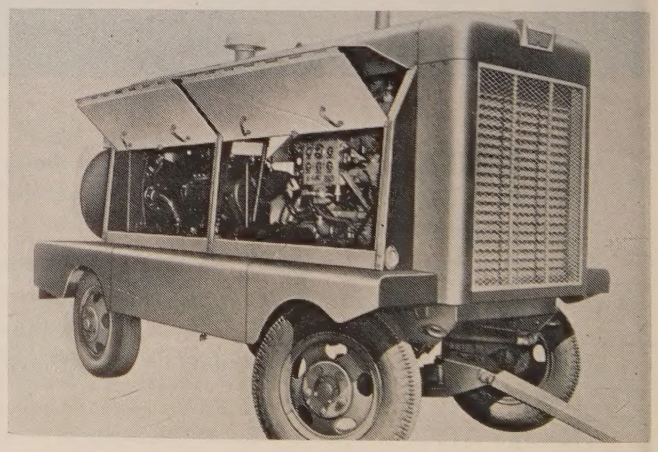
Powered with a 77½-hp. heavy-duty gas engine, the manufacturer claims the unit has more power than any other 4-wheel drive machine of similar size and capacity. Clearance is 8 ft. 4 in. under the cutting edge with bucket in dumped position. The machine has 4-wheel hydraulic brakes which are sealed to keep out dust and dirt. Boom structures are positioned ahead of the operator for safety, and the front-end styling gives fullest visibility while digging. Both fuel tank and transmission can be checked and filled from ground level. The hydraulic system includes an oil reservoir which is closed and pressure controlled. A separate fan-cooled radiator handles the transmission and torque converter oil. This new Payloader went into schedule production last month.

. . . Write No. 152

Worthington adds another Blue Brute

Adding to its line of portable compressors, **Worthington Corp.** introduces a 900-cfm. Blue Brute rotary. The unit incorporates the Worthington over-under design that puts the second stage compressor cylinder directly under the first stage, with benefits of accessibility, easy maintenance, and self-draining of the compressor oil. The compressor is equipped with automatic control which stops the engine in case of high



temperature in the discharge air, overheating of the cooling water or low oil pressure. Other controls prevent engaging the clutch while the engine is running, or starting the compressor with air pressure in the air receiver. This unit is the latest addition to the Worthington compressor line which start with 85 and had a maximum size of 600 prior to the announcement of this larger model.

. . . Write No. 153

(Turn to page 156 for more New Equipment. New Literature can be found on page 152.)

The WEST from WASHINGTON

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

Any thinking Westerners do about what Congress does or does not do from now until July should be done against the background of some political mathematics. The fact is that the net current Congressional session is going to be very small.

It figures this way: As of the first weeks of April, Congress had been in session more than three months, and had actually passed only one significant bill (the stream-pollution measure proposed by Rep. Blatnik)—which was promptly vetoed. No other bills except the usual minor "private" measures had gone to the President at all.

Not more than three months remained for any actual work—the mid-July political conventions will put an effective stop to the session. And three months isn't really much time for the enormous and sometimes complex procedures involved in getting any substantial piece of legislation through the Congressional works.

So it figures that Congress will pass the necessary bills on appropriations, without which the government would come to a slow halt; and some few other matters that seem to promise political advantage. Everything else will be swept under the rugs in the rush for adjournment.

The reason, of course, is the long and at times apparently aimless debate over Civil Rights legislation—with which many matters of interest to construction (like federal aid to schools and public housing) are closely tied. As April began, for instance, the Senate was entering its eighth week of debate on civil rights alone—and nearly every other activity of the Senate had been held up for that long, including all-important committee hearings.

From a national standpoint, the situation actually isn't as bad as it sounds, since much of the major legislation (like appropriations for airports, the Landrum-Griffin labor bill, public housing measures) went through last session on a two-year basis that will keep programs running into the term of the next President.

But from the regional viewpoint of Westerners, it'll mean delay of another year on many projects. There are several dozen measures somewhere in the Congressional machinery that affect this part of the nation, ranging all the way from authorization of California's huge San Luis project (S.44) to others that would authorize the Secretary of the Interior to continue delivering irrigation water to certain lands in the State of Washington, and to authorize a change in the name of Green Peter Dam in Oregon to the Richard Neuberger Dam.

* * *

Incidentally, you haven't heard the last on anti-stream-pollution appropriations, even though the President successfully vetoed the Blatnik bill, and proponents said they'd introduce no further legislation this session.

You probably noted that the House disregarded the President's budget request for $20 million to aid communities in pollution abatement (under this request, Western states would get about $3.8 million, see April column) and raised the figure to $45 million for Fiscal 1961—the same level as in the current year.

When the Senate gets to this matter (appropriations for the Department of Health, Education and Welfare) it will apparently approve the raise—most Congressmen are convinced that stream pollution is a good political "issue". Mr. Eisenhower may not want to use the veto when he gets the final bill—since the approved sum is only part of the total appropriation. And of course, he doesn't have to spend the money, even if it is approved by Congress.

* * *

But there's no doubt that the whole subject of water resources—prominently including pollution, but also including conservation—will be of major importance in the upcoming political campaigns and in legislation next year.

That's an obvious conclusion when you look closely at the work done so far by the Senate's Select Committee on National Water Resources, which is contributing greatly to over-all water knowledge, even if no meaningful legislation should ever come out of its deliberations.

The contribution is in the form of numerous "committee prints" (now numbering more than 30) of information supplied to the committee by the many federal agencies concerned in some phase of water use and conservation. This mountain of material already represents an invaluable mine of information, most of it never before assembled in one place. Subjects include such things as "Vegetation Management and Water Yields in the 17 Western States"; means of reducing evapo-transpiration of water; major surveys of water resources and how they are used; suggestions for further research and the like.

The Select Committee has been supplying this information to irrigation, sanitation and other officials and engineers as broadly as it can within its appropriations, but has no specific authorization to supply it to any large number of individuals.

And as to legislation, have no fear but that the committee's action will produce some of major interest to construction: In a recent speech, Chairman Robert Kerr (D-Okla) commented that federal, state and local expenditures for water conservation over the next 20 years must total at least $180 billion—of which the federal share should be about $100 billion.

Much of any such expenditures would go to the Western states. But, not surprisingly, an increasing amount will be spent in the Northeast, said Kerr, where rapid urbanization and industrial development is already straining available water resources.

* * *

A specific example of what's being done is included in one report, by the way, concerning surveys of the Arkansas and Red rivers, where hidden springs and oil fields pour an estimated 15 trainloads of salt into the stream daily. Army engineers have used an electronic computer to cover the 8-state river systems. The computer was given "thousands" of readings gathered from local sources, which showed salt content at a large number of stations along the rivers. From this data, the computer was able to compile a statistical picture showing salt characteristics for the whole river system.

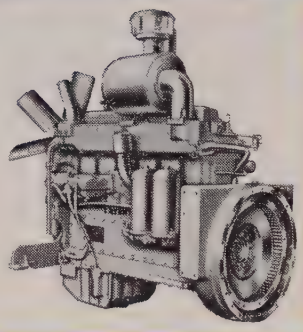
Once suspicion was pinpointed to a particular area, engineers could find offending salt sources quickly.

The Corps feels that diversion works or other devices at these points can take out much of the

(Continued on page 34)

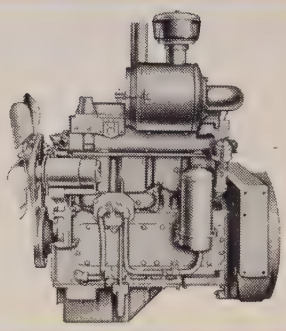
FOR YOUR JOB?
with new compact engines!

New No. 12E Motor Grader features new compact 115 HP Engine



New No. 112E Motor Grader features new compact 85 HP Engine

The new No. 112F is similar in appearance, but features a Turbocharged 100 HP Engine.

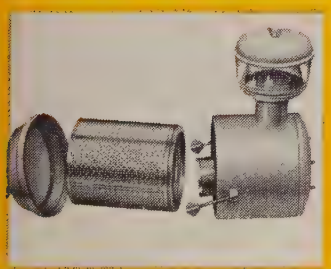


NEW HIGH TORQUE. Though the engines in the new Cat Motor Graders are designed specifically for each machine, they all develop higher torque than previous models and have other basic improvements in common. For example: shorter, stiffer blocks and crankshafts... stronger, distortion-resistant cylinder heads... improved cooling systems with greater capacity... engine lubricating oil conditioning... and advanced design fuel systems —new, compact fuel injection pumps with barrel and plunger assemblies in easy-to-service pump housings.

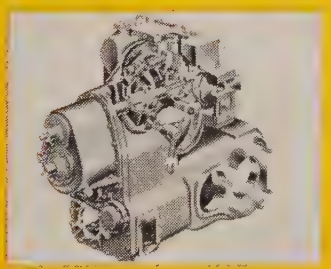
NEW STARTING ENGINE. Now standard is a new two-cylinder, vertical starting engine to replace the horizontal engine. All three Motor Graders use a modern 12-volt electric system. An optional 24-volt system is available for use in moderate climates where direct electric starting is practical.

PERFORMANCE-PROVED FEATURES. While many advances have been designed into the compact new engines, certain time-tested features have been retained. To mention a few: precombustion chamber design that delivers maximum horsepower on heavy, economy-type fuels... steel-back aluminum bearings... wet-type "Hi-Electro" hardened cylinder liners... and aluminum pistons with cast-in ring band.

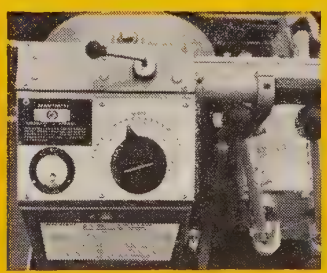
OTHER HIGH-PRODUCTION FEATURES IN CAT MOTOR GRADERS



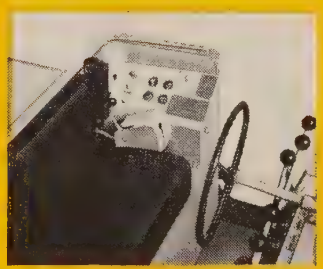
NEW DRY-TYPE AIR CLEANER (standard) removes a minimum of 99.8% of all dirt from intake air during every service hour. Can be serviced in 5 minutes. Cuts your maintenance time by as much as 70% and substantially reduces maintenance costs. Cleaner air also extends engine life.



EXCLUSIVE OIL CLUTCH (standard) provides up to 2000 hours service without adjustment, the equivalent of about 12 months of "adjustment-free" operation. A Caterpillar development proved by millions of hours of use, it virtually eliminates down time for clutch repair.



AUTOMATIC BLADE CONTROL (optional) cuts grading time in half. Operator sets desired slope on dial and only has to control depth of cut. Manufactured by Preco Incorporated, the unit automatically maintains blade slope within ⅛" in 10'. Available factory installed.



IN-SEAT STARTING (standard) offers operator finger-tip convenience and positive starts in any weather. Another feature: improved mechanical blade controls provide precise adjustment and ease of engagement. "Anti-creep" lock makes blade stay put under load.

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

salt, make the river water more usable. It hopes to be able to extend the technique to other Western streams, thus providing new sources of fresh water.

* * *

Depending somewhat on the outcome of current world-wide discussions on nuclear testing, a tunnel near Carlsbad, N.M., under the Salado Salt beds, will be the scene of the first controlled test of nuclear energy as an explosive.

Scientists of the Atomic Energy Commission, appearing before a joint subcommittee on Atomic Energy, said the tests (to which foreign observers will be invited) will be a part of "project Plowshare"—largely devoted to peacetime uses of nuclear energy. Development of "more sophisticated" nuclear explosives which reduce resulting radioactivity makes the tests possible.

What AEC scientists hope to achieve is an explosive that could be used for general large-scale blasting, such as might be needed to create an often-discussed deepwater harbor in Alaska; and for other purposes that might include creation of underground water reservoirs, connection of underground aquifers with the surface, digging of major canals.

Specifically, scientists told congressmen, an atomic device that would yield energy of a few kilotons could be built for about a half-million dollars, if produced in relatively small numbers.

* * *

New Mexico's San Juan County will be the scene of the first major study undertaken in the U.S. to determine effects of environmental radiation on the health of large population groups. The U.S. Public Health Service and the New Mexico State Department of Health will cooperate.

Site is one of the largest uranium producing areas of the United States – you'll recall that studies some time ago determined that radioactivity in the surface water of the Animas River has been higher than in most areas.

A second study will be conducted in the St. Louis, Mo., area—this one with particular emphasis on effects on milk in a predominantly dairy-farm countryside.

* * *

Two new-type reclamation contracts, one in California and the other in Oregon, are being hailed as the beginning of an era of faster contract work in reclamation projects.

The California contract—inci-

"WE DRILL 15% MORE...AND DRILL IT FASTER... WITH TIMKEN CARBIDE INSERT BITS"

Special report from H-E Lowdermilk, Inc.

LOCATION: U.S. HWY. 287, LARAMIE, WYOMING

Operating conditions: granite and schist

H-E Lowdermilk, Inc. of Virginia Dale, Colo., had to drill through hard abrasive ground—mostly granite and schist—in constructing U.S. Highway 287 between Ft. Collins and Laramie. So they chose Timken carbide insert bits and drilled 15% more feet-per-bit! And they drilled faster, too, because the Timken bits stayed sharper longer than other bits they had used.

Which Timken Bit should you use?

The Timken carbide insert bit is your most economical bit in hard, abrasive ground. But in softer ground, use the low-cost Timken all steel multi-use bit. And because both bits are interchangeable in the same thread series, you can switch bits when the ground changes. Dozens of different Timken bits fit the same drill steel. Both are made from Timken electric-furnace fine alloy steel, have special shoulder unions that protect threads against drilling impact. For help in selecting the right Timken bit for your job, phone or write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.*

TIMKEN®

removable rock bits

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dentally the first result of that "jurisdictional agreement" last year between the Corps of Engineers and the Bureau of Reclamation—is the first ever negotiated where a state guarantees repayment of conservation water storage costs associated with a federal multi-purpose project.

The state will underwrite $13.7 million of the costs, so that construction can go ahead on New Hogan and Black Butte dams in the Central Valley without the normals delays involved in individual negotiations with affected water districts. The state will get its money back from the districts affected.

The dams are to be built by the Corps of Engineers. BuRec, under the "jurisdictional" agreement, assumes responsibility for contracting for all irrigation services (flood control is the primary purpose of the $35.6 million projects) associated with such work in California.

Second contract was executed with the Talent Irrigation District, in Oregon's Rogue River Basin, authorizing the local organization to do drainage and minor construction on a Reclamation project in excess of the statutory limit of $200,000 in federal funds. Under a newly-passed federal law, such excess work is authorized, if approved (as has been done in this case up to $500,000) by Interior committees of both houses of Congress. The work will cover enlargement of laterals, reconstruction of farm crossings and replacing minor structures.

Washington observers think use of these new contract forms will speed contract letting on major irrigation and water use construction throughout the West.

* * *

A major sewage treatment plant, with a definite international implication, would be built at San Diego, if Congress approves a bill (HR 9189) by California's Rep. R. C. Wilson. The bill would authorize the U. S. government to work with Mexican authorities to come up with a plan to handle sewage from Tijuana which has recently forced closing of many beaches in the San Diego area.

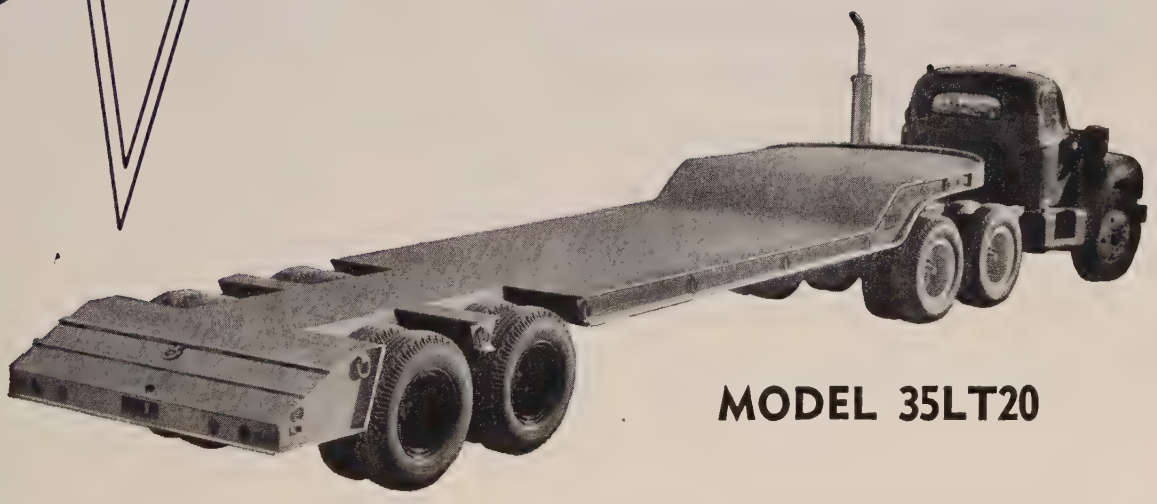
Wilson said that sanitation authorities feel the only answer is the construction of a master sewerage project, by the city of San Diego, with Tijuana joining in. Mexican authorities, he said, have expressed willingness to cooperate in such a plan.

FROM ANY ANGLE . . .

IT'S THE PAYLOAD THAT COUNTS

with the Loadmaster Lo-Boy that has a full width goose neck — rubber bushed and rubber mounted walking-beam type bogie and 20-inch tires. The design of this trailer permits dual use — not only as a machinery trailer — but as a float for handling all types of construction material. This Loadmaster Lo-Boy is the lightest all steel trailer on the market today.

The 35-ton Lo-Boy is equipped with standard glad hands and jumper cable socket — standard steel heat-treated king pin — decked with Inland 4-way deck plate — 10:00 x 20 12-ply tires on ten hole Budd wheels — 16½ x 7 brakes with individual air cylinders — bogie with 18,000 pound axles — Inland 4-way deck plate cleated ramp — with recessed tow bar socket and pin in center rear frame member at toe of ramp — tool box recessed in top of goose neck at front — and D-type rigid lashing rings — 5 each side — with one swinging type on each side of goose neck — and one recessed in the rear ramp.



MODEL 35LT20

Overall width	8'- 0"
Overall length	37'- 0"
Length back of gooseneck to front wheel well	15'- 6"
Length front wheel well to back of trailer	10'- 5"
Length Gooseneck deck	8'-10"
Length center of kingpin to center of Bogie	26'- 6"
Wheel clearance from center kingpin	76"
Height—Top of loading deck to ground	41"
Height—Top of gooseneck to ground	56"
Clearance—Frame Bottom	27"
Height—5th Wheel Plate to ground	49"

Miller & Smith

Mfg. Co., Inc.

500 PHOENIX AVE., NW — STATION B, BOX 6007
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Strongly backing the President's budget-message recommendations, the Department of Interior has come out in full support of five identical bills (S.2700 and others) that would authorize construction of the $170 million Fryingpan-Arkansas project in Colorado.

At the same time, Interior also reported favorably to Congress on proposed legislation (S.2060) that would provide that non-federal entities share at least 30% of the cost of flood-control or flood prevention projects. Interior said it would recommend one exception, however: projects where erosion and water control works for soil and moisture conservation on public lands are of primary importance.

* * *

Comments in these columns and elsewhere on the $25 million proposed barrier dam to protect Rainbow Bridge National Monument from "impairment" by waters from Glen Canyon Dam got some quick Congressional reaction.

Calling such an expenditure "a nonsensical and indefensible waste of taxpayers' money," Utah's Senator Frank E. Moss introduced a bill (S.3180) to remove provision for the barrier dam from the list of appropriations requested by President Eisenhower under terms of earlier acts which authorized construction of Glen Canyon.

* * *

Briefs: The first base for the solid-fueled Minuteman ICBM will be built at Malmstrom Air Force Base, near Great Falls, Montana, to house three missiles in underground silos. Contracts for the estimated $20 million installation will be let in January, 1961. . . . Less than 1% of the area of Alaska has been surveyed, but the Bureau of Land Management's Cadastral Engineering staff will have to do much of the job within the next 25 years, so that the state can select some 103 million acres of public lands now held by the federal government. . . .

California and Arizona are being urged (by their Congressional delegations) to conduct serious talks about the possibility of a new project in the Lower Colorado Basin to increase hydroelectric power supplies for these two states and Nevada. Spur for the program is an attempt to avoid a head-on battle between the Arizona Power Authority and the city of Los Angeles, both of which have filed applications for construction of a new dam at Bridge Canyon.

WESTERN CONSTRUCTION

" . . . the least possible obstruction and inconvenience to the public . . . "

SUMMER MONTHS are a severe strain on highway construction in the West. Contractors are rushing to make the most out of the short work season in the mountains, and the tourists are swarming. The combination accentuates normal traffic problems. It places added responsibilities on both engineers and contractors, with need for a maximum of understanding and tolerance.

Only by earnest cooperation can that familiar phrase in all state highway specifications: ". . . the least possible obstruction and inconvenience to the public . . ." be realized.

Traffic normally consists of local and out-of-state cars, with the latter group reaching a sharp peak during the vacation period. Local drivers should be reasonably tolerant, since they are familiar with conditions and stand to benefit later from temporary inconvenience. The real tourists, however, on their way from Iowa or some other flat state to a vacation at one of the national parks in the West represent a real problem. They are always in a hurry, they are only passing through with no interest in the permanent benefits resulting from inconvenience, and they probably have never before driven in the mountains. They do not realize there can be no convenient detour provided through a mountain pass. They don't want to get pushed too far over to the edge of the roadway. But, they are welcome visitors—it says on the state highway map.

The contractor's point of view is naturally negative on the whole subject. Traffic impedes all of his operations, which means loss of time and money, and he has no direct concern with the "tourist industry." However, his contract provides for taking care of this traffic. Specifications always contain such familiar phrases as:

". . . kept continuously open to public traffic . . in a condition satisfactory to the engineer"

"at his own expense"

"furnish adequate flagmen"

"Detours . . . shall be maintained at all times"

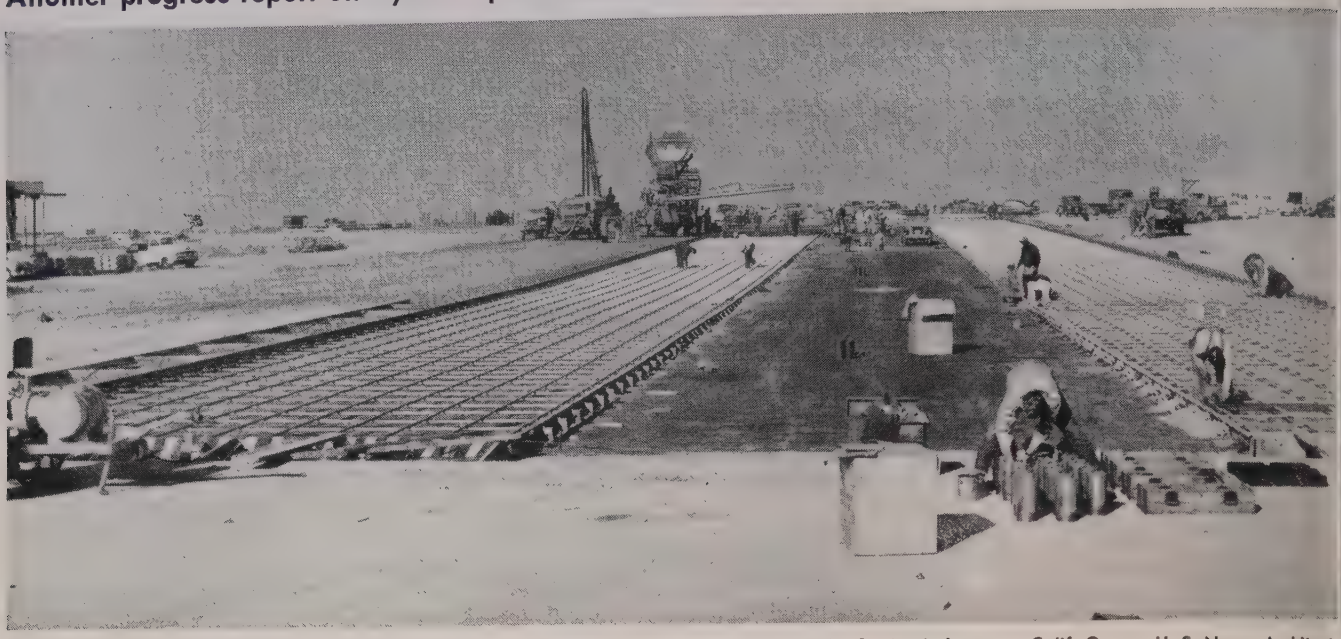
". . . shall bear all expense . . . without direct compensation"

On the other hand, the resident engineer is required to interpret these requirements that cannot be stated in more specific language. He must represent the state in securing proper consideration for the visitors. Each state is proud of its standing as a host. It is within the hands of the resident to realize the position of being host, with an element of reasonableness.

Between these two divergent positions must come the final solution. Each must appreciate the position of the other. The engineer must outline the requirements as he interprets the policy and desires of the department. The contractor must carry out these provisions as part of his contract. The first involves policy, the second involves money.

The answer lies in the mutual acceptance of the problem and a desire to find a solution under difficult circumstances. As the vacation "foreigners" begin to swarm over the mountain highways of these Western states, preparation and planning are in order for all concerned if the "obstruction and inconvenience" phrase is to have its true meaning.

Jim Ballard



New maintenance apron taxiway at the Naval Air Station in Lemoore, Calif. Owner: U. S. Navy. Architect & Engineer: Porter, Urquhart, McCreary & O'Brien, Los Angeles. Contractor: Griffith Company, Los Angeles.

New prestressed slab at Navy Air Base is one of longest post-tensioned projects

A new maintenance apron taxiway at the Naval Air Station in Lemoore, Calif., is a 512′ x 75′ *continuous ribbon of prestressed concrete.*

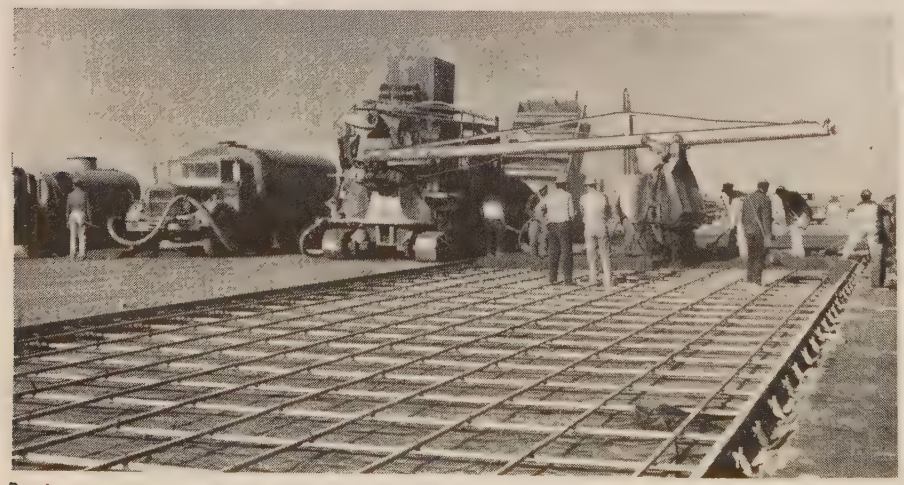
A complete "package" of materials and equipment for post-tensioning was furnished the contractor by Ryerson. Included are 30 tendons (each containing eight ¼″ wires) that extend the entire 512′ length of the slab . . . and 205 tendons (with six ¼″ wires) that run the width. This means a tendon every 2½′ in both directions. Stressing force of 150 psi was applied to the slab. Special anchor heads for these tendons, plus stressing and grouting equipment, were also supplied by Ryerson.

The concrete is 6″ deep in the 312′ x 25′ center section, and tapers to 9″ at the edges. If the concrete had not been prestressed it is estimated that a uniform depth of 12″ would have been required to provide equal strength.

Post-tensioning also brought these important advantages: (1) It completely eliminated the need for troublesome transverse expansion joints. Should the concrete crack for any reason, it will immediately seal itself *watertight* because of tensioning. (2) No wire mesh was needed. (3) Re-bars were required only around the edges where load is concentrated.

The taxiway was constructed by Griffith Company of Los Angeles, under the supervision of the U. S. Navy Bureau of Yards and Docks. Captain V. C. Bertelsen CECUSN, Resident Officer in charge of construction.

Close-up of post-tensioning tendons. Note that re-bars are only required along edges of slab at top of picture.



Pouring concrete at one section. Post-tensioning tendons are spaced 2½′ apart in both directions.

This is just one more example of the growing use of post-tensioning for prestressed concrete construction, and of the growing reliance on Ryerson for post-tensioning materials, equipment and know-how. On *your* next project, call your nearby Ryerson plant for details on *any* of our products and services for the construction industry.

Joseph T. Ryerson & Son, Inc. Plants at: Boston • Buffalo • Charlotte • Chicago • Cincinnati • Cleveland • Dallas • Detroit • Houston • Indianapolis • Los Angeles • Milwaukee • New York • Philadelphia • Pittsburgh • St. Louis • San Francisco • Seattle • Spokane • Wallingford

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KING PUBLICATIONS

WESTERN CONSTRUCTION

MAY, 1960

OVER-ALL VIEW looks downstream through dam site. Steep rocky slopes surrounding inlet of diversion tunnel at left are extensively rock-bolted and covered with heavy wire mesh to protect workmen from falling rock. Similar precautions are in place at outlet.

Ingenuity pays off at Hanson Dam

Record flood tops outlet works cofferdam on western Washington project. Contractor's innovations in construction methods include:

- ***Cooling scraper brake housings with water***
- ***Blasting with ammonium nitrate in wet ground***
- ***Rock bolting and grouting with new techniques***

EVERY CONSTRUCTION PROJECT has its problems but Howard A. Hanson Dam (formerly Eagle Gorge), a Corps of Engineers project on the Green River 40 mi. southeast of Seattle, has more than its share. It's hard enough to construct anything in an area where the annual rainfall is around 90 in., and this winter has been exceptionally severe. The river was at flood stage four times, and on November 22, 1959, the water level rose 17 ft. in eight hours to top a bulkhead cofferdam which was protecting the excavation for the outlet works.

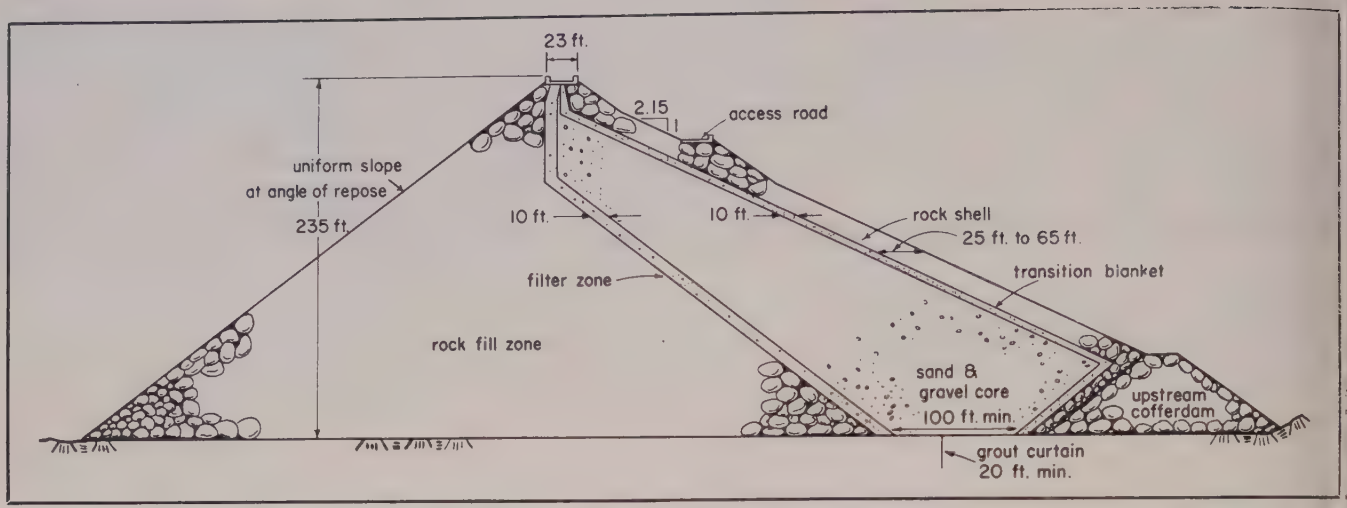
Another difficulty the builders are experiencing is the highly fractured rock which overlooks the diversion tunnel portals and spillway excavation. To control slides and falling rock about 4 mi. of rock bolts have been installed as well as 11,000 sq. yd. of heavy steel mesh.

The structure is located in the watershed from which the City of Tacoma draws its water supply. This means that the contractor must do nothing to impair the quality of the water without advance permission from the City. Having to build a dam without muddying the water changes normal construction procedures in several respects.

To offset the cost of overcoming these obstacles the contractor, a joint venture of Henry J. Kaiser and Raymond International, has come up with a number of interesting ideas, including a system of water cooling of scraper brake drum housings to dissipate heat generated on the steep haul road, packaging ammonium nitrate in long bags for use in wet ground, and innovations in rock bolting and grouting. Details will follow after a look at the project background.

Purpose of project and design

Hanson Dam is primarily a detention dam to temporarily retain flood flows. Normal river flows



MAXIMUM CROSS-SECTION shows design of zones. Because dam will temporarily detain flood waters, absolute imperviousness is not required. Note absence of impervious core. Sand and gravel zone will limit seepage to 5 cfs. Total dam volume is 1,500,000 cu. yd.

will be passed through the outlet tunnel in the left abutment. If flows reach flood stage, the tunnel control gates will be regulated to limit releases to safe downstream channel capacity and excess water will be impounded in the reservoir. When the storm causing the flood passes and the river discharge returns to normal, the reservoir will be drawn down as quickly as possible to make room for the next flood. When the flood season ends in March some water may be retained in the reservoir for use during the dry, low-flow summer season.

Since a minimum flow must be maintained in the river to satisfy requirements of fishing interests and the City of Tacoma (which uses a gravity supply line that would collapse if the flow were interrupted) it is not necessary that the dam be 100% impervious. The cross-section of the structure which accompanies this article shows that there is no impervious zone. In addition to the flow of water passing through the outlet tunnel, it is estimated that about 5 cfs. will pass through the embankment itself as controlled seepage.

The two main zones of the dam, a rock fill and a sand and gravel core, are separated by a 10-ft. thick filter of clean gravel. The rock fill will have a volume of 775,000 cu. yd. and the sand and gravel core will total about 560,000 cu. yd. Rock excavation for the spillway and outlet works will be 650,000 cu. yd., nearly balancing the rock-fill zone of the dam. Total volume of the embankment will be about 1,500,000 cu. yd. The dam will rise 235 ft. above the river bottom and will have a crest length of 450 ft.

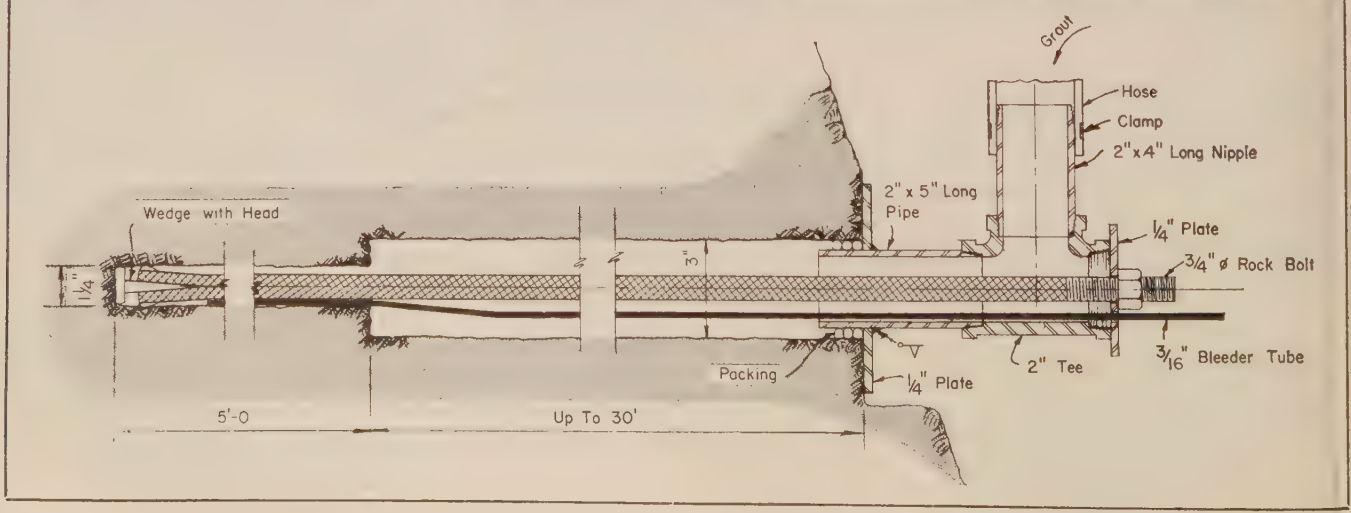
The absence of an impervious zone simplifies the construction of the dam in that the clayey material usually used is very difficult to work with in wet weather. Western Washington is the wettest area in the nation.

The dam site and reservoir area was traversed at a low level by the main line of the Northern Pacific Railroad. About 14 mi. of the railroad were relocated under five separate contracts with a total cost of more than the dam itself. The railroad relocation cost about $17,000,000 compared to the Kaiser-Raymond prime dam contract of $8,840,000.

Sanitary restrictions

The headworks of Tacoma's water supply system are located just 3 mi. downstream from the dam site. When the contractor wishes to carry out an operation which would muddy the water, he must first check with the Corps of Engineers to make sure that Ta-

BOLTING AND GROUTING system is shown in this drawing. Large diameter hole was used because of difficulty of removing material by blowing in smaller hole. Small diameter in last 5 ft. and beefed-up wedges improve gripping action. Grouting of rock bolt holes was needed to develop specified strength. Feature is small vent pipe to bleed air and water, permitting grout to completely fill hole.



coma can get along without its Green River supply for a day or two. Since Tacoma does not always have sufficient water in storage to grant this permission, the contractor must make sure that his advance plans are flexible.

The specifications against adding turbidity to the river means that the contractor must not waste directly into the river or its tributaries material or water used in drilling or in sluicing the rock fill. This water, along with the run-off from fresh cut slopes, is collected and pumped to settling ponds where it percolates back to the river through gravel filter beds. The contractor has developed a 2-ac. settling pond upstream and a 4-ac. pond downstream. The downstream settling pond is located 180 ft. above the river bottom, which requires a 2-stage pumping system to transport water to it. Of course, the turbidity restrictions do not apply during rainy weather when the river is naturally muddy.

The contractor has planned a recirculation system for water used in monitors during the placement of the rockfill zone. The water will be recovered at the toe of the embankment by deep well pumps and fed to the monitors. When the water becomes too dirty it will be diverted to the settling pond and a fresh supply taken from the river.

Diversion scheme

Re-routing of the river through the diversion tunnel must be carried out between March and May —not before March because of the flood danger, and not after May because the embankment would not be high enough to withstand the floods which start again in November. The contractor originally hoped to divert the river this spring but the excessively wet winter has forced him to reschedule it for next spring.

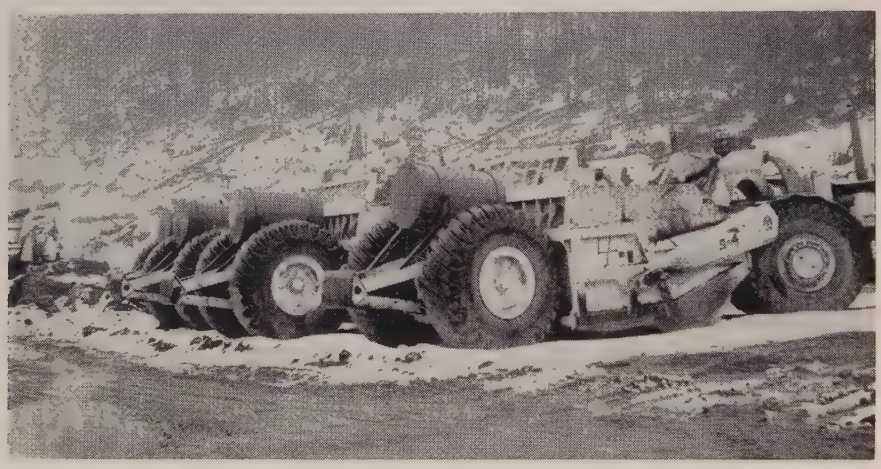
The contractor will need permission from Tacoma to work in the river bed for about 2½ days. To maintain the required minimum flow of 200 cfs. while the cofferdam is rising the contractor plans to use a by-pass canal around the cofferdam with a stop-log overflow weir. As the pool rises logs will be dropped in place to maintain the minimum flow but no more. When the pool has risen 35 ft. the water will flow into the diversion tunnel. At that point the cofferdam can be completed without adding further turbidity to the water.

BEFORE Concreting is under way at outlet works and settling basin. Note double-walled, ballast-filled bulkhead protecting excavation from high water. Compare this view with front cover when tractors braced incompleted bulkhead against earlier flood which brought water to within 3 ft. of topping 12-ft. high barrier.

DURING Record-breaking flood tops bulkhead by 4 ft. and floods outlet works excavation. Lamp in foreground shows vantage points in top photos.

AFTER Flood left bulkhead smashed and outlet works filled with water, silt, and driftwood. Rock wall on opposite bank had stood for decades undamaged.

SPECIAL FRAMEWORK mounted on rails was used to carry by-pass pipe sections into the diversion tunnel and lower them into place in trench below invert. At far left is James F. Grafton, resident engineer, with chief assistant Jack Monarch.



WATER DRUMS mounted on scrapers are part of sprinkling system used to cool brake housings which heated up excessively on run down steep haul road from borrow pit to river bottom.

As can be seen in the cross-sectional drawing, the cofferdam will eventually become part of the main embankment.

Diversion tunnel

Gibson & Roberts, Inc., with Eugene Murphy as superintendent, drove the diversion tunnel on a subcontract, holing through in September 1959 after a little more than 3 months' work. The tunnel is a 19-ft. horseshoe, 900 ft. long, and involved about 20,000 cu. yd. of excavation.

Gibson & Roberts used a truck-mounted jumbo with 6 drills. Koehring Dumptors were used in the mucking cycle.

One of the problems in driving the tunnel was the existence of the Northern Pacific railroad track. The muck haul-road crossed the tracks twice and 14,000 cu. yd. of material were removed before the railroad was diverted to its new location in June 1959. An electric signal system and a flagman were used to control traffic at the railroad tracks.

Lining the tunnel with concrete is now under way by the prime contractor and is about 30% complete. A Rex double Pumpcrete places concrete behind a 30-ft. long rail-mounted form made by Berkeley Steel Co. Concrete is placed through any one of 18 windows in the form. Manual screw jacks are used to collapse the form for resetting.

Concrete is supplied from a Noble batch plant located 3,200 ft. from the tunnel portal. The semi-automatic plant, new on this job, has a Smith tilting, 2-cu. yd. mixer. Concrete is brought to the tunnel with three 4-cu. yd. Dumpcretes made by Maxon Co. Inc.

Rock bolting methods

A tremendous amount of rock bolting of an unusual nature was required to stabilize the steep, highly fractured and seamy slopes overlooking the tunnel portals and outlet works excavation areas. Bolts average 20 ft. in length but some as long as 40 ft. were used.

At this writing, about 4 mi. of rock bolts have been installed, along with 11,000 sq. yd. of steel mesh to protect workmen from falling rock. The mesh, a product of Colorado Fuel & Iron, is made of No. 9 wire formed in 2 x 2-in. squares and delivered to the project in rolls 12 ft. wide.

When the rock-bolting operation began standard 1-in. diameter bolts of the slotted edge type about 10 ft. long were used, but it was soon found that these would not resist the torque and pull requirements. To develop greater strength longer holes were required, but it was difficult to remove mud and drillings from a long hole by blowing. This problem was solved by using a 2½-in. diameter bit for the first part of the hole and a 1½-in. bit for the last 5 ft. Larger wedges were developed and the slots on the end of the bolts were lengthened to 10 in. Lugs were welded to the ends of the bolts to improve gripping action. In several locations a 4-in. length of rod 1⅜ in. in diameter was welded to the end of the bolts and covered with weld beads to increase the gripping strength.

A majority of the holes were driven with a Gardner-Denver Model 123 Air Trac mounted on staging while working from benches in the excavation. Some holes were driven from a skid carrying two Gardner-Denver S.F.-99 drifters. The skids were positioned either by a cable and winch from the top of the slope or on an American Road Equipment Co. Econmobile operating from the bottom of the slope.

Grouting technique

To develop sufficient strength it was found necessary to fill the holes with grout after the bolts were in place. Special techniques had to be developed because of the difficulty of completely filling the holes with grout due to groundwater and air pockets. It was important to make sure grout reached the back of the hole near the wedge.

To solve this problem, a section of pipe 2 in. in diameter and 2 ft. 6 in. long was slipped over the rock bolt and into the hole. Enough of the pipe was left protruding to make the connection with the grout hose. The annular space

between the pipe and the side of the hole was packed with oakum. Next a ⅜-in. diameter vent pipe was pushed through the pipe to the rear of the hole. When grout was introduced to the hole, all air and water in the hole escaped through the vent pipe. By watching the end of the vent pipe for the appearance of grout, it could be determined when the grout had reached the back of the hole. When this occurred the vent pipe was withdrawn. All bolts grouted in this manner successfully withstood pull tests of 20,000 psi. on the next cross-section of the rods.

The bolts were allowed to extend from their holes in various lengths so that wire mesh could be attached to them without having to conform exactly to the unevenness of the slope. If the mesh were attached to the bolts flush with the rock surface, it would be necessary to overlap the 12-ft. strips of mesh by at least 1 ft. to make sure none of the slope was uncovered.

GROUTING rock bolts was needed because of seamy nature of rock. Note small pipe extending from bolt role toward right of photo. This is vent pipe to bleed air and water from hole allowing grout to reach rear of hole. See drawing on page 50.

Fighting the floods

A hint that it would be a rough winter was given in the month of September when over 19 in. of rain fell—a record for that month. The river was in flood stage on September 26, October 11, November 22, and December 15.

The early flood season caught the contractor trying to finish construction of a protective bulkhead, or cofferdam, around the outlet works excavation, where concreting of the settling basin and lower portion of the tunnel were under way. The bulkhead was to consist of a double row of piles faced with timber lagging, cross-braced and filled with rock.

When the flood of October 11 arrived, only the outer wall of the 12-ft. high bulkhead was in place —there was no bracing or rock ballast. At the height of the flood, the water rose to within 3 ft. of overtopping the barrier. Probably what saved the incompleted bulkhead was the idea of lining up behind it every available truck and tractor on the project to counteract the weight of the water. After a nerve-wracking day the water finally subsided and everyone breathed in relief, feeling sure the worst was over.

In the next couple of weeks the bulkhead was completed and work continued in the outlet works excavation. But on November 22 the river rose an unprecedented 17 ft. in 8 hours, topping the bulkhead by 4 ft. The river flow was estimated at 26,000 cfs., about 4,000 cfs. higher than the worst flood ever recorded on the river. The contractor managed to get all major pieces of equipment out of the excavation and the tunnel, but a few pumps and light pieces of equipment were lost under a blanket of mud and driftwood in the flooded area. The disheartening job of cleaning up the mess is still going on and the contractor has definitely lost his chance to divert the river this spring. The flood took out the contractor's haul bridge over the river which consisted of two 50-ft. timber spans. It is now being replaced with a single span prestressed bridge at a 5-ft. higher elevation. The new bridge will consist of three prestressed girders, 101 ft. 5 in. long, furnished by Concrete Technology Corp. of Tacoma.

BLASTING with ammonium nitrate in wet ground required packaging nitrate in bags. Inner bag is plastic, for waterproofing, outer bag is heavy paper to resist puncturing. On upper platform is mortar mixer in which nitrate particles are coated with diesel oil.

Blasting with nitrate in wet holes

The contractor has developed equipment and procedures to make the use of ammonium nitrate economical as a blasting agent despite the wetness of the

(Continued on page 56)

NOVEL SEWER TRENCH METHODS AT BOISE

Conventional equipment adapted to operating conditions, and a new rig developed. Work continued through winter months to avoid high ground water level during irrigating months.

DEVELOPED by Morrison-Knudsen engineers, a 70-ft. long conveyor on wheels is towed by this Parsons 310 trenching machine. The trencher discharges directly on the belt and the elevated material dumps over a grizzly that drops fines back into the trench, cushioning the fill over the pipe laid immediately behind the trencher. Oversize is pushed into the trench later.

HOW does a contracting team perform one of the biggest sewer jobs ever let in a single piece in an area where intensive summer irrigation pushes the water-table close to the surface?

Morrison-Knudsen Company, Inc., Boise, Idaho, and Valley Construction Company, Seattle, its associate on the project, have two answers to this question:

(1) Keep working straight through one of the coldest and wettest winters in recent history.

(2) Adapt conventional machines to tough operating conditions and develop hybrid rigs that perform fast and efficiently.

The big job on which the contractors came up with these answers involves construction of nearly 135 mi. of sewer lines on what is known as the "bench" of M-K's hometown. Located on Boise's southern flank, the bench is a broad, bluff-edged plateau nearly 70 ft. higher than the city itself.

Here, under a $4,042,000 contract awarded last November by the Bench Sewer District of Ada County, M-K is installing nearly 95 mi. of trunk lines, mains and laterals and about 40 mi. of service-connection lines to provide modern waste disposal for some 22,000 persons in a 9-sq. mi. area. The far-flung system will deliver the area's sewage to an existing city treatment plant now being enlarged by other contractors to handle the stepped-up volume of waste.

Construction of the new network is being performed under five schedules, or divisions. M-K is working on two of the schedules, with the other three being handled by Valley, long-time associate and coadventurer of M-K on water-

works and sewer construction jobs.

Trunk lines range from 24 to 36 in. in diameter, mains and laterals from 8 to 18 in. and service-connections from 4 to 6 in. Pipe varies from Cen-Vi-Ro's bell-and-spigot spun concrete pipe to Transite pipe connected with collars.

Extending along the edges of streets and intersecting irrigation canals, highways and railroad lines, the big project's trenches have an average depth of 12 ft., with some reaching down to 22 ft. Such deep ditches would be no problem in many another area, but on Boise's intensively irrigated bench the rising water-table could give the contractors plenty of headaches and, at the very least, might force them to costly dewatering operations.

Countering this threat, the contractors pushed ahead virtually without let-up through one of Boise's worst winters to complete as many of the deep lines as possible before the start of the irrigation season. Another objective of the big winter push was the use of open cuts, instead of tunnels, to install lines under major irrigation canals at 14 separate locations before the arteries began carrying water. With cuts ranging from 25 to 40 ft. in length, most of the canal crossings now have been completed.

Careful planning also is enabling Valley to use open cuts, instead of trickier tunneling, to make three of the project's five railroad crossings and a major highway crossing. The three rail crossings, all on spur lines, are being performed on Sundays, when tracks can be cut without disrupting traffic. The highway crossing is being made by open-cutting only two of the highway's four lanes at a time and diverting the entire flow of traffic into the other two lanes.

Hand-excavated tunnels are being used for the project's other two railroad crossings, both of which run under the main line. Liner plate first is being installed in the tunnels, each 70 ft. long, and then the pipe is being jockeyed into place.

Other obstacles confronting the sewer builders include gas mains and service lines, water mains and underground telephone cables.

Eight separate spreads of equipment generally were used for the project's big winter push. To four of them, Valley deployed conventional Northwest and Marion backhoes with capacities ranging from ¾ to 1½ cu. yd.

Valley put a conventional Northwest 6 dragline with a 1½-yd. bucket to work on another spread, but adapted it to a tough operating condition characteristic of the Boise bench. The condition: streets so narrow that, in many places, excavated material could not be heaped beside the open trenches.

A 70-FT. BOOM on a Northwest dragline had sufficient reach to permit excavated material to be dumped back into the trench. Pipe laying was carried forward directly behind the dragline, using a protective shield for the crew, as shown.

MORE CONVENTIONAL was the third method, that used a Northwest backhoe for excavating the trench and piling material along the side, where street-space permitted.

Equipped with a 70-ft. boom, the dragline is tailor-made for such a limitation on the sewer builders. Its long reach enables the rig to cast excavated material directly on the newly back-filled path of the advancing trench instead of to the sides. As the dragline crawls backward, excavating in front of itself and casting beyond them, workmen install pipe within a shield under the boom.

M-K is using conventional Northwest 6 and Koehring 304 backhoes on two of its three spreads. But far from conventional is the hybrid excavating-backfilling rig assigned to the third.

Developed by M-K engineers, it consists of a Parsons 310 ladder-type trenching machine towing a 70-ft.-long, wheeled conveyor. Excavated earth dumps from the trencher onto the conveyor, while men simultaneously lay pipe in the short intervening stretch of open ditch between the trencher and the discharge end of the conveyor.

As the earth reaches the end of the conveyor, it falls into a grizzly, or vibrating screen, that drops segregated fines into the trench over the newly laid pipe. Coarse material drops beside the trench to be machine-pushed into the ditch as the last step in the backfilling.

Fast and efficient, the dual-pur-

pose hybrid is a specialty tool used only in selected locations. It performs best in trench depths under 9 ft., and on level terrain.

On such a far-flung job involving so many interested parties and affecting so many people, coordination and public relations become king-sized chores ranging with the construction itself.

Aiming at clock-work coordination, the contractors distribute a "Schedule of Operations" at the start of every week to nearly 40 individuals. They range from representatives of the consulting engineers to the sewer district manager to materials suppliers. Others on the distribution list are county and city police and fire department officials, utility representatives, school officials, and even the state's civil defense director.

A comprehensive report on each of the project's 7,200 service connections also is distributed so that —as one M-K supervisor puts it— "everyone is working from the same records."

Public relations is set up on the same efficient basis. Reports on street closings and conditions are supplied to newspapers and radio and TV stations, as well as to police and fire departments. Schools and dairies are advised of current work areas so buses and milk trucks can be properly routed.

Complaints are quickly investigated and reported in full written form. Work orders are issued for justified complaints, moving through well-defined channels for action whether they be for street grading, righting a mail box or filing an insurance claim.

Over-all coordination and business management of the project is by J. V. Otter, M-K special projects engineer. O. J. Daly is assistant project manager specializing in public relations and public service, Pete Kaliles is safety supervisor.

James Arcorace, president, heads Valley operations, with Roland Estby as resident manager and Dwane Jensen as general superintendent. Field operations on M-K's two schedules are directed by J. A. Harker, Boise district manager, with Russell Healey as superintendent and Al Matheson as master mechanic.

Earl Reynolds, Jr., is Idaho manager and John Eskelin is project engineer for Cornell, Howland, Hayes & Merryfield, the Boise and Corvallis, Oregon, firm that is serving as consulting engineers to the sewer district. Andrew J. Wahl is the sewer district's manager.

HANSON DAM

(Continued from page 53)

ground. The nitrate is first poured into plastic (polyethelene) bags 4 in. in diameter and 4 ft. long, which are inserted into slightly larger Kraft paper bags. The inner plastic bag is waterproof and the outer bag protects the plastic from tearing and puncturing. Usually a stick of dynamite is placed in each bag for detonation when Primacord is used; or blasting caps when electricity is used.

To minimize the expense of bagging the fertilizer, the contractor developed a special packaging procedure. A two-story wooden framework, protected from the elements by canvas, was erected a short distance away from the project. On the upper floor the nitrate is mixed with diesel oil (a necessary step whenever nitrate is used as an explosive) and on the lower floor the nitrate is placed in the bags.

As a safety precaution the diesel oil is stored in two drums about 25 ft. from the mixing plant. The drums are placed on a 25-ft. high pedestal so that oil can flow by gravity to the plant. Thorough and even mixing of the nitrate and oil is assured by use of a 3-cu. ft. capacity mortar mixer. Several modifications had to be made to the mixer to make it safe for this use. The small electric motor which powers it was heavily insulated, the steel gear drive was replaced with a rubber drive, and the steel mixing paddles inside the drum were replaced with plastic paddles. These steps removed the possibility of sparks developing from metal to metal contact. Although the ammonium nitrate is one of the safest explosives to store and handle, only an amount sufficient for immediate need is brought to the mixing plant at one time. Compounded "sticks" are stored in regulation magazines.

In addition to several Gardner-Denver Air Tracs, the drilling equipment on the project consists of three 5½-in. G-D drills and two 4½-in. G-D drills. Air is supplied by a 900 G-D compressor and two 600 G-D compressors as well as a stationary plant containing three 885-cfm. G-D compressors.

Building the embankment

The rock excavated from the diversion tunnel, outlet works, and downstream settling basin have been stockpiled for use in the main dam embankment after the river is diverted. Material for the sand and gravel core comes from an excellent deposit located about a mile away on the left abutment at an elevation of 200 ft. above the crest of the dam.

The earth-moving fleet consists of four Euclid S-18 scrapers, one Euclid TC-12, eight Kenworth end-dump trucks, six Caterpillar D8-H tractors, two Caterpillar 12 patrols, one 2¾-yd. Michigan front-end loader, a Ko-Cal 60-in. belt loader, and 2 Northwest 800 shovels.

The one-mile haul road is very steep and in the lowest section features a severe 15% grade. When earth-moving first began it was found that when a heavily loaded scraper descended the haul road at a safe speed the brakes heated up so much as to require almost constant attention from the maintenance crews. Often it was necessary to let the scrapers stand idle before making another run in order to give the brakes time to cool off. The contractor solved this problem with typical ingenuity. Steel drums of 100-lb. capacity were welded to the rear of each scraper. Water from these tanks is allowed to run over the brake drum housing as a coolant. It is not a recirculating system and every few trips the drums must be refilled with water. The idea has worked very well and will be continued until the embankment has been raised high enough to eliminate the steep section of the haul road.

Personnel

For the U. S. Army Engineer District, Seattle, the project is under the over-all supervision of Colonel R. P. Young, district engineer. Resident engineer on the project is James F. Grafton, with Jack Monarch as chief of construction, and Bill Berryman as office engineer.

For Kaiser-Raymond, H. E. "Curly" Christman was project manager, assisted by "Chuck" Peterson. Peterson took over the top post in March of 1960 when Christman was promoted and called to the headquarters office of Kaiser in Oakland, Calif. Project engineer is Andy McDermott, office manager is Lowell Britton, master mechanic is T. A. Hamm, and superintendents are Norm Swanson, Mickey Robbins, and Rocky Myers.

(See photo on page 136.)

SUPERINTENDENT George Bomgardner.

One crane builds a bridge

Pile driving, excavation, concrete pouring, forms and falsework on 652-ft. bridge handled with single truck-mounted unit on county F.A.S. project.

FORM panel and work platform swung away from completed pier by crane rigged with two cables. The unit is a Bucyrus-Erie 30B truck crane.

A 652-FT. CONCRETE box girder bridge is being constructed with only one piece of heavy equipment, a 35-ton truck crane, by Affiliated Engineers & Contractors Co., Inc., holder of a sub-contract for the Geer Road Bridge structure across the Tuolumne River near Modesto, Calif.

The bridge is part of a $500,000 F.A.S. project of Stanislaus County Road Department to supply the final link in a major north-south county road. Contract covers the structure and some 6,000 ft. of earth embankment approaches over the bottomland of the river valley between the low bluffs which mark the boundary of the river's course. Prime contractor is Lee Stephens Co. of Stockton, Calif., which is handling the earthwork and grading.

The structure work, handled by Affiliated, of Florin, Calif., is marked by efficient use of an equipment spread consisting primarily of a Bucyrus-Erie 30B truck crane rigged with two cables over the boom. Equipped with more attachments than a patent vacuum cleaner, the crane does everything, sometimes two at a time. It drives sheet pile, excavates cofferdams, places templates, forms, concrete and falsework timbers.

Remainder of the spread is a Jaeger 600-cfm. compressor with auxiliary manifold to run numerous small tools, and an International utility crawler with backhoe.

Despite the small spread, Superintendent George Bomgardner faces a logistic problem. At the bridge site the river is only 35 ft. wide, but the road distance to get from one bank to the other is 11 mi. The crane weighs 70 tons, and must be completely dismantled to move over the road, making a costly and time-consuming move. The superintendent must schedule his job to make as few of these 11-mi. detours as possible.

Bridge structure

The bridge is composed of 5 main spans, each 100 ft. long, supported on concrete piers, plus two approach spans of 76 ft. each. Piers are in the deep gravel riverbed, and must be set on 40-ft. piles. From 20 to 24 piles support each footing block. Piers rise an average 38 ft. from the footings. At the bridge site the river curves around a gravel bar, its flow confined to a channel near the south end about 10 ft. deep and 35 ft. wide. Only one of the piers is placed in the water, although all must be built inside cofferdams, since the water-table is practically at the surface of the bar.

The contractor elected to use this gravel spit rather than build a work bridge. By bulldozing material out from the end of the gravel bar, he can place all but two piers from the north bank. Then he will have to shift to the south side for these last two piers as well as the south abutment.

Cofferdams

Cofferdams for pier footings are constructed of steel sheet pile placed around a rectangular cage of 12x12 timbers tied together with vertical 1-in. tie rods. Sheet piles are placed starting at one corner working both ways and driven about 3 ft. in the ground. When all four sides are set, piles are sunk with an air-driven pile hammer

BRIDGE site with narrow river in foreground. Distance from bank to bank is 35 ft., but contractor must detour 11 mi. to move equipment.

TEMPORARY piling in channel will support timber cage on projecting beams. When sheet pile is in place, interior timbers will be removed.

suspended from the crane and powered by a Jaeger 600-cfm. compressor.

The crane switches to clamshell for excavating inside the cofferdam, tapping the frame down as the material is excavated beneath it. Excavations run 15 to 20 ft. deep, with about 10 ft. under water.

When the cofferdam is excavated to grade, Raymond hollow steel piles are driven to a depth of 40 ft., aided by jetting. Pile shells that developed leaks and filled with water are filled with tremie using a long tube-like bucket.

A tremie concrete seal 3 ft. thick is poured around the protruding pile ends in the bottom of the excavation. A 7-sack mix is used, compared to a 6-sack Class A concrete in the structure itself. The tremie is mixed to a 4- to 5-in. slump, and placed through a long funnel with a gated spout held in position with the crane. The crane holds the funnel with one line, and hoists bucket filled from transit mix trucks with another. As soon as the concrete seal sets, the hole is de-watered with 4-in. and 6-in. Jaeger pumps, and a Jaeger diaphragm mud pump installed for continuous de-watering.

The 12x18x3 ft. pier footing is formed with 2x12 planks, used because they are easier to remove from the narrow space inside the sheet pile. When the footing is cast, the pump is shut off and water allowed to rise over the concrete for curing.

A shallow recess is formed in the footing to receive the pier. The 70 No. 11 re-steel bars which will go into the pier in two parallel lines are bent inwards to cross in the center at the base of the pier and then bent to rise vertically along the outside faces of the pier. This design provides a hinge for movement of the pier under earthquake stress.

Piers are formed with plywood panels on 2x6 frames, assembled with both snap ties and she bolts. Piers are 3-ft. 3-in. x 11-ft. rectangular shafts averaging 38 ft. high.

Bomgardner rents two sets of sheet piles, so he can build his piers in leapfrog sequence, stripping one while the other is curing. Sheet piles are pulled and the timber cage extracted before piers are stripped to provide protection against accidental nicks in the concrete from a swinging pile. Piling is removed with a pulling hammer operated by compressed air. An International utility crawler with back hoe and dozer blade is used to pull the gravel away from the piling before removal, and to backfill the excavation when the job is finished.

Building in the river

Bomgardner has set up a template composed of timber piles and heavy cross-beams to hold his cofferdam frame for the pier being placed in the river channel. Piles are set in a rectangle with two projecting cross-beams at the top. The cofferdam cage will be hung from these cross-beams while sheet pile is positioned. Then the template will be dismantled and the area excavated. The pier is located only a few feet from the north shore, where the crane will be spotted on a gravel pad bulldozed out from shore.

Timber falsework will be used to support the forms for the box gir-

TIMBER CAGE forms template for sheet pile cofferdam driven for pier footing excavation. Piers supported on 40-ft. piling in deep gravel underlying riverbed. Completed piers in background.

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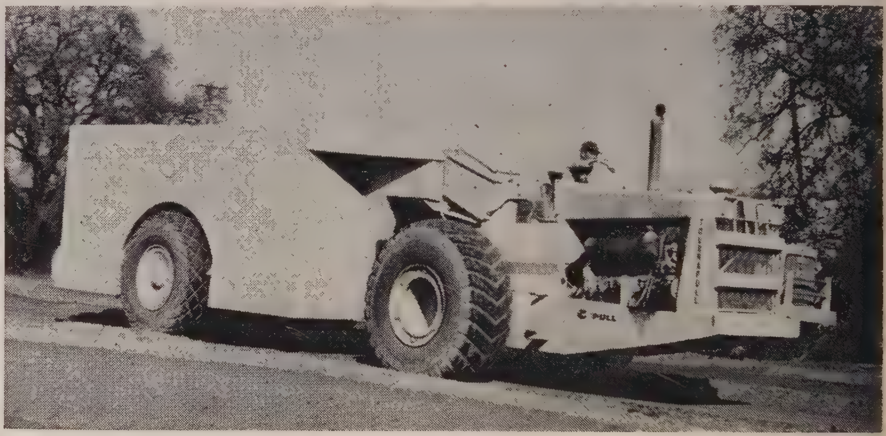
der bridge deck. Between the abutment and the first pier, it will be erected on timber pads laid on the ground, but for the main spans, supports will be wooden piles driven into the gravel. The falsework structure will be wedged from the top rather than the bottom, with wedges inserted between the uprights and the heavy stringers, which support 2x6 joists and the plywood forms.

The contractor will use two cranes to pour the deck, spotting one on each side of the river for the over-water span.

Detailing of forms was done by Bomgardner, a veteran of the construction industry who came up the hard way, studying engineering and drafting by correspondence to fill out an 8th grade education. He also studied safety in the familiar practical school of hard knocks and has the scars to show for it. He insists on adequate safety precautions on this job. Pile bucks must use steel stirrups, and tag lines are used on the piling. A safety cable is attached to the boom when pulling the piling to prevent a back lash if the cable parts.

The next move for the superintendent will be to cross the river and place the last pier and south abutment. This is one he isn't anticipating with any pleasure. His rig weighs about 70 tons. It will take a crew of 5 men two days to make the move, stripping the crane of boom, counterweight, and outriggers, hauling the parts 11 miles on a low-bed trailer, and re-assembling on the south shore. He expects to make at least two round trips before the bridge is completed in September. The job includes 1,920 cu. yd. of Class A concrete, 563,000 lb. re-steel, 4,956 ft. of concrete pile, and 1,360 ft. of bridge railing.

BORROW for road fill loaded from bank by Cat D8 crawlers pushing in tandem. Modified Caterpillar DW20 gets 25-ton load of fine sandy material without prior ripping.



FILL compacted with Bros 50-ton pneumatic unit pulled by LeTourneau-Westinghouse C Pull tractor. Fill extends across bottomland on either side of bridge, averaging 20 ft. in height.

Embankment construction

Prime Contractor Lee Stephen's, Co., prime contractor, is constructing a long embankment from the bluffs at the edge of the river valley to the bridge abutment. The roadway will be about 25 ft. above the level bottomland. A similar, shorter fill is being completed on the opposite side of the river.

This might be classed as the ideal earthmoving job. Most of the fill is constructed from borrow taken from a nearby hillside where material is practically pure plaster sand, with just enough fines to give it excellent compaction qualities.

Superintendent Vic McFarland is using three Caterpillar DW20's which are push-loaded by two Cat D8 tractors, to move the material. The scrapers load from the raw bank, without benefit of prior ripping. It takes a mighty shove to load them, but the loads are tremendous, often exceeding the weight of the scraper rig.

Compacting is done with a Bros 50-ton pneumatic unit pulled by a 2-wheel LeTourneau-Westinghouse "C-Pull" prime mover. A 6,000-gal. Euclid water tank patrols the fill. Spreading is done with 2 Caterpillar No. 12 motor graders and a D8 bulldozer working the cut through the bluff.

The job covers 138,000 cu. yd. of roadway excavation, 120,000 tons of imported borrow, 30,000 tons ISM, 19,000 tons UB, and 7,000 tons of plant-mix surfacing.

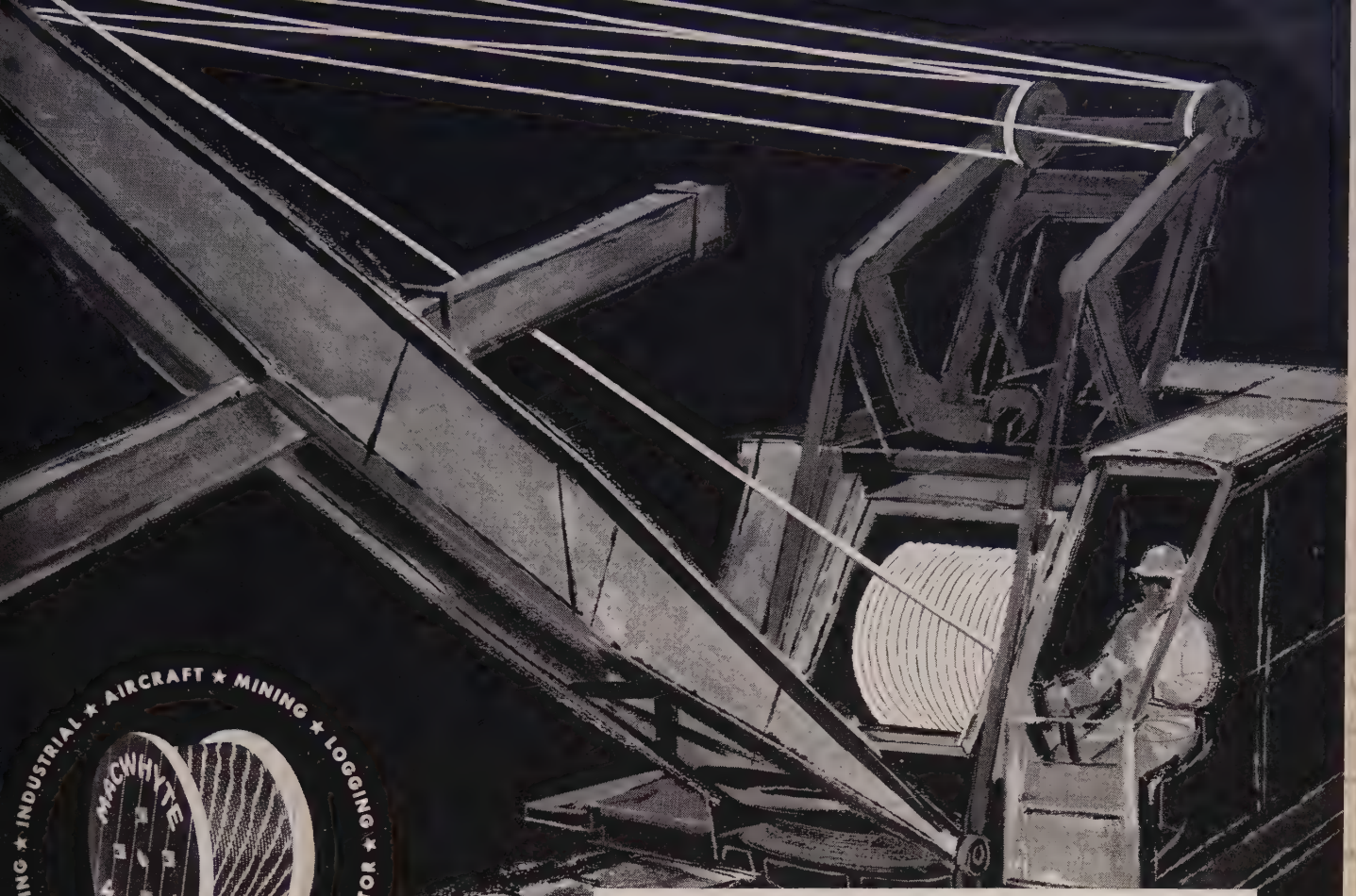
An Armco multiplate culvert 14 ft. in diameter will be installed midway in the cut area to provide an underpass for a farm road at a potentially dangerous intersection. Bottom segment of the circular culvert will be filled with plant-mix to make a level roadway through the underpass.

Personnel

Prime Contractor Lee Stephens', superintendent is Vic McFarland. Pete deFerrari is master mechanic; George Johnson, engineer.

For the bridge sub-contractor, Affiliated Engineers and Contractors, Inc., George Bomgardner is superintendent; A. A. Alameda, pile buck foreman; and Willard Everret, carpenter foreman. Concrete for the job is supplied by Allied Concrete, Modesto, and re-steel by Klinger Steel Co., Inc., Stockton.

Project is built for Stanislaus County road department. Don Hubbard is resident engineer, and Ellis Delbon is road commissioner.



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Road maintenance has its related liability problems

A statement of the general rules, and some cases that cover the extent to which public agencies are responsible in providing a roadway safe for all traffic.

The importance of this subject to all maintenance engineers, supervisors, and administrators employed by states, counties, and municipalities makes this article a particularly valuable discussion. It is a slightly condensed version of a paper presented at the Annual California Streets and Highways Conference, Jan. 28-30, at the University of California, Los Angeles, by Harry S. Fenton, Asst. Chief, Legal Division, California Department of Public Works, assisted by Lloyd S. Davis, Deputy County Counsel, Los Angeles County, and Robert F. Carlson, Attorney, Legal Division, California Department of Public Works.

TO WHAT EXTENT are public agencies obligated to the public to provide a roadway safe for all traffic? What safeguards must be provided? These questions cannot be answered in the abstract, but must be considered in specific factual situations and in light of the present law on liability of public agencies and their employees.

The particular subject under discussion is liability for ordinary negligence and for dangerous or defective conditions arising from the maintenance of highways. This does not include liability arising out of street or highway construction. The parties that may be involved are the state, cities, counties, and their maintenance personnel.

Rules of liability

All officers and employees of public agencies (including the state) are liable for their own negligent acts or for dangerous or defective conditions of public property created by them. However, they are not liable for the acts of their subordinates, unless they directed the negligent act or participated in it. Thus, a city street superintendent is generally not liable for the negligent placing of a warning sign by his sign man where the street superintendent did not help place the sign or direct its placement.

No public officer is liable for the dangerous or defective condition of public property unless:

1. The injury was the direct and proximate result of the condition;
2. The officer had notice of the condition or it was directly attributable to work done by him or under his direction in a negligent manner;
3. The officer had authority, and it was his duty to remedy the condition and that funds for that purpose were immediately available to him;
4. That within a reasonable time after receiving notice of the condition and being able to remedy the condition he failed to remedy or give adequate warning.
5. The highway was being carefully used and due care was being exercised to avoid the danger.

From the above it is apparent that our legislature has recognized the fact that public employees, particularly maintenance personnel, are by virtue of their employment exposed to many kinds of claims and suits arising out of the performance of their duties. The legislature, in addition, has authorized the purchase of insurance for public officers and employees and has thus afforded an additional measure of personal protection.

Cities, counties, and state

Cities and counties are liable for dangerous or defective conditions of public property. However, a city or county is not liable for injuries to persons or property resulting from a dangerous or defective condition of public property unless the agency authorized to remedy the condition:

1. Had knowledge or notice of the condition; and
2. For a reasonable time after acquiring knowledge or receiving notice, failed to remedy the condition or to take action reasonably necessary to protect the public against the condition.

The two most important requirements are (1) notice, and (2) failure to remedy the condition or warn the public.

The state, however, is not liable for dangerous or defective conditions of streets or highways. This is sometimes referred to as the doctrine of sovereign immunity. Because of the doctrine of sovereign immunity, the state officer and employee are more likely targets for suits arising out of the dangerous or defective condition of state highways.

Some factual problems

Only a few of the more common situations are discussed here, particularly those situations which have recently been before our appellate courts.

TRAFFIC SIGNALS: The day of the single overhead traffic light is gone. We now have traffic signals mounted on large overhead arms as well as four and five phased synchronized radio controlled signals. The more complicated the system, the greater the possibility of defect.

A recent case (*Hinton* v. *State*, 124 Cal. App. 2d 622) involved an action against a signal superintendent for the Division of Highways. At an intersection there was installed, in addition to a traffic actuated signal, a pedestrian push button signal device. The green signal when actuated by cross traffic gave a green signal 10 sec., but when actuated by the button gave a pedestrian 24 sec. to cross. A sign on the push button, "To cross the street, push button and wait for green light," was missing. The plaintiff failed to push the button and had only 10 sec. to cross. After the light changed, she was hit by a vehicle which approached the intersection on the green light. In this case, the court held that the missing sign constituted a dangerous and defective condition of public property, since it was the direct and proximate cause of the accident. The superintendent of electrical and signal maintenance was held liable.

In *Goodman* v. *Raposa*, 151 Cal. App. 2d 830, the plaintiff, a minor child, brought suit against the City of Stockton for injuries he received as a result of being struck by a vehicle while in a pedestrian crosswalk. The arterial was posted with STOP signs and had an electric traffic signal light at each of the four corners of the intersection. The maintenance of the signals was the duty of the city by joint agree-

(Continued on page 67)

LIABILITY

(Continued from page 62)

ment of the city with the State of California.

Four days prior to the accident, it was observed that the traffic lights at the intersection in question were not working properly. The same day, the power was turned off and the light signals put out of operation entirely. The accident occurred while the traffic lights were out of order and no substitute measures were taken for the direction of traffic at the intersection. The appellate court held there was no evidence that there was a dangerous or defective condition at the intersection. The court further held that when the lights were turned off, the flow of traffic was governed by the STOP signs and the city could not be held liable for failing to direct traffic while the lights were being repaired. The moral of this case is to turn off the defective signals where the traffic will be controlled by STOP signs.

Vegetation impairs vision

The most common examples of this factual situation are intersections obscured by vegetation and STOP signs obscured by vegetation. First, it must be remembered that generally there is no liability for failing to install a STOP sign at an intersection. However, there is a duty to replace a missing or damaged STOP sign. But is there a duty to cut or remove vegetation which obscures an intersection or a STOP sign? Recently several courts have had an opportunity to rule on these situations.

The first case to rule on this point was *Perry* v. *City of Santa Monica,* 130 Cal. App. 2d 370. There, the plaintiffs were passengers in an automobile that was struck in an intersection. The plaintiffs alleged that a dangerous and defective condition existed. It was a heavily traveled blind intersection and did not have traffic signals, STOP signs, or other traffic control devices. The day after the accident, the city placed STOP signs at the intersection. The court held (1) the vehicle code does not compel local authorities to place signs or signals at a particular intersection, and (2) where the street itself is reasonably safe for public travel, it is not rendered inherently dangerous solely because a municipality fails to cut down natural vegetation which tends to obstruct the view at an intersection.

In a very recent case, *Mercado* v. *City of Pasadena,* 176 A.C.A. 27, decided last December, this problem was before the appellate court. This was a suit by a motorcyclist against the City of Pasadena and the operator of a motor vehicle arising out of a collision at an intersection. The motorcyclist alleged that a dangerous and defective condition existed at the intersection in that there was (1) a boulevard STOP sign too far in advance of the intersection; (2) an extensive jog at the intersection with a through highway; and (3) a hedge on private property which obscured the view of motorists.

The court held that the question as to where the STOP sign should be placed was for the determination of the city and did not constitute a dangerous or defective condition of public property.

The court then ruled that the city did not have to install a STOP sign or other warning device because of a jog in its intersection. The court then went on to hold that a city or county is not responsible for a hedge on private property which obscures the view of an intersection.

Traffic striping

Another great source of liability are cases involving traffic striping. Where the markings on a street lead a motorist into danger, liability is sure to follow. The maintenance engineers and superintendents must be vigilant to eradicate markings which lead the motorist into danger. Examples are two sets of double white lines which "switch" the motorist into the oncoming lanes of traffic and the center line that leads to the bridge which is out.

Striping problems usually occur after a resurfacing job and before or after detours are put in. The leading case in California is the one where the center line of a street led directly into the center of a railroad crossing wigwag stand. This was held to be a dangerous or defective condition.

Weed control and smoke

New factual situations involving weed control have recently come before our courts. One involved the damage to adjacent crops from the escape of weed sprays.

In *Neff* v. *Imperial Irrigation Dist.,* 142 Cal. App. 2d 755, the plaintiff complained that the Irrigation District, to exterminate weeds, sprayed "2-4-D" so that the chemical drifted onto the plaintiff's property and damaged his cotton plants. The question was whether this conduct constituted the taking or damaging of private property. The court held that the District was not liable in this situation since there was no damaging of the plaintiff's property for a public use.

A similar case, *Teilhet* v. *County of Santa Clara,* 149 Cal. App. 2d 305, involving smoke, resulted in liability of a county. There, the county was engaged in burning weeds along its right-of-way adjacent to the traveled way. The plaintiff proceeded at 10 miles per hour through the smoke which was drifting across the traveled way, and collided with a car coming in the opposite direction. The appellate court held that a dangerous condition of public property is created by burning of grass and weeds along a highway which obscures the vision of motorists.

However, the court also stated that the conduct of a person driving into smoke may constitute contributory negligence, which, of course, is a factual question for the jury.

Legal problems of liability

Although there are usually many legal problems involved in dangerous and defective condition cases, there are several which require explanation.

NOTICE OF CONDITION: Notice is one of the primary items of proof in order to establish liability of a city or county, as well as officers and employees, for a dangerous or defective condition of public property.

To establish liability, the plaintiff must prove that the public officer or agency had actual or constructive notice of the condition. When the officer or agency did not have actual notice but should have known of the condition by passage of time or reasonable inspection, the proof of this item is met; this is called constructive notice. Thus, it is not necessary that officers of a public agency have actual knowledge of the precise defect in the premises which occasioned the injury. A public agency may be chargeable with notice of the unsafe condition of the sidewalk or street though nobody may have known of the situation. This rule of constructive notice is qualified

(Continued on page 89)

Contractor places 3,300 ft. per day as . . .

Triple-drum paver speeds progres

f giant jet runway job at Yuma

A GIANT triple-drum paver is completing a successful maiden voyage on the desert near Yuma, Ariz., where a $4,119,000 jet age runway is under construction at the Marine Corps Auxiliary Air Station. The Koehring Tribatch paver, operating in conjunction with two conventional dual-drum machines, enables the contractor to place more than 3,300 ft. of 25-ft. width concrete paving in thicknesses up to 13 in. per 8-hr. shift.

The project is designed by Navy engineers and construction is under the auspices of the 11th Naval District. The contract was awarded to a joint venture composed of M. M. Sundt Construction Co., of Tucson, Ariz. and M. J. Bevanda Co., Inc. of North Hollywood, Calif., whose bid was low of 14 received and substantially under cost estimates. Contract covers construction of a 13,300-ft. runway 200 ft. wide, a parallel taxiway 75 ft. wide, and four connecting taxi strips. Runway is constructed of concrete 11 in. thick with reinforcing strips at either end, while taxiways are 13 in. thick. Both are supported on a 6-in. thick soil-cement base course. Other work includes earthwork, grading, site clearing, paving of crash strips and blast aprons, drainage, runway and taxiway lighting, fencing, and other incidentals. The job entails about 1,000,000 cu. yd. of excavation, 500,000 sq. yd. of 6-in. thick soil cement, 250,000 sq. yd. of 13-in. thick reinforced concrete, and 250,000 sq. yd. of 11-in. thick un-reinforced concrete. The contract covers 400 days and will be completed in August. Plans and specifications were prepared by Johannessen and Girand, architect-engineers of Phoenix.

Earthwork

Earthwork involved in the project consists primarily of grading and construction of subgrade to the required elevations. Native materials in place or from borrow sites adjacent to the runway and taxiway locations are used where fill or embankments are required. The contractor is using Michigan Model 310 scrapers and conventional motor graders in his earth-moving operations. The material consists of fine sandy soils and subgrade compaction presents no problem. Very little rolling is required to achieve subgrade densities.

About 4 mi. of irrigation pipe was used to prewet the area before commencing earthwork. Pre-wetting used approximately 45,000,000 gal. of water.

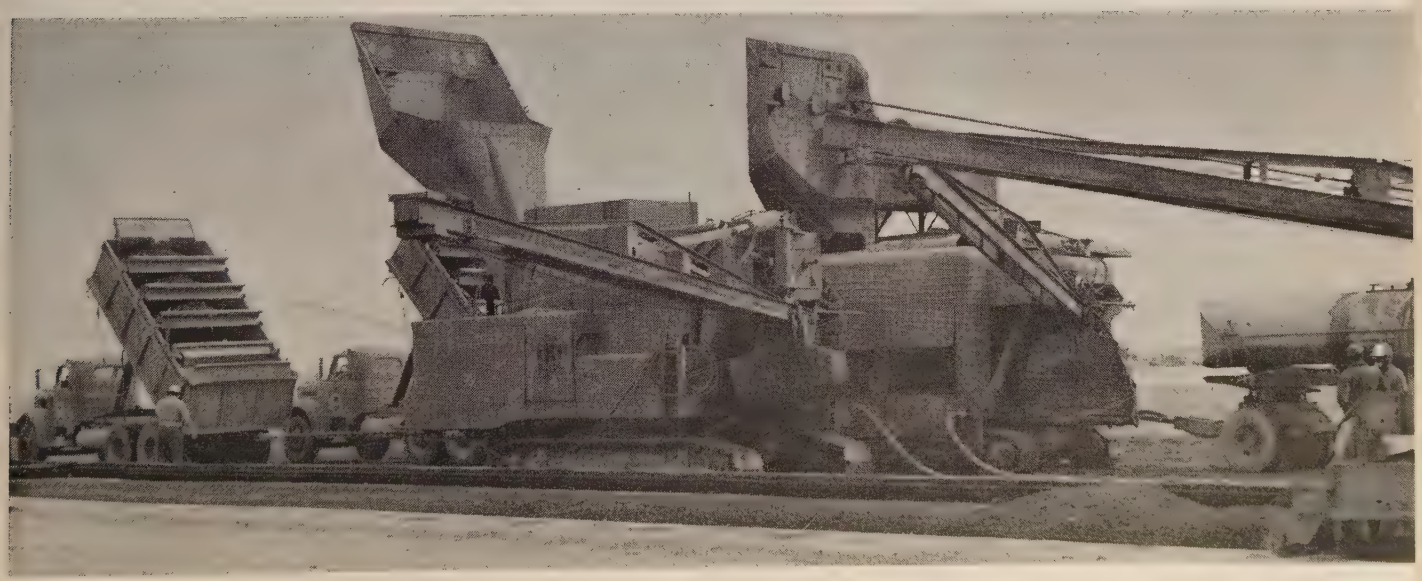
Operations

To insure a minimum of interference with the paving operations, the contractor is following the turnaround procedure in constructing runways and taxiways. A central 25-ft. lane is first paved full length, the equipment is brought back to the starting point and the adjacent lane is paved full length in the same direction. On reaching the end of the second lane, the equipment is brought around to the other side of the central lane and a third lane paved in the reverse direction. This procedure is followed until the full width of the runway has been completed. As a result, mixers, batch trucks, and accessory equipment ride on the subgrade adjacent to the lane being paved, while the lane on the opposite side is being formed, and there is no need for equipment to travel on the finished concrete or on the completed soil-cement base course, or the finished subgrade.

After the subgrade has been

LEFT, New Koehring Tribatch paver starts on the initial 25-ft. lane of 13,300-ft. runway at Yuma Marine Corps Auxiliary Air Station.

BELOW, two pavers working together in concreting the third lane. Tribatch on the inside, and a Rex dual drum on the outside.



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In the Union research laboratory and in those of the steel producing organization in which Union is integrated, technicians are hard at work on many new projects. They were started and will be finalized in the field where Union engineers spend more time than in the laboratory.

Classic example of what results from such deep and constant probing is the Tuffy family of wire ropes and slings, each one of them engineered to a specific job. Among 1600 standard wire rope constructions, in day to day production, none could be classified as the ultimate low cost wire rope for bulldozers, draglines, scrapers or hoisting equipment. One by one new metallurgical specifications and rope and sling constructions were tailored to meet the different but tough operating conditions inherent in the jobs these machines perform.

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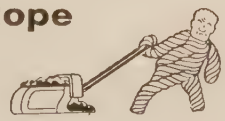
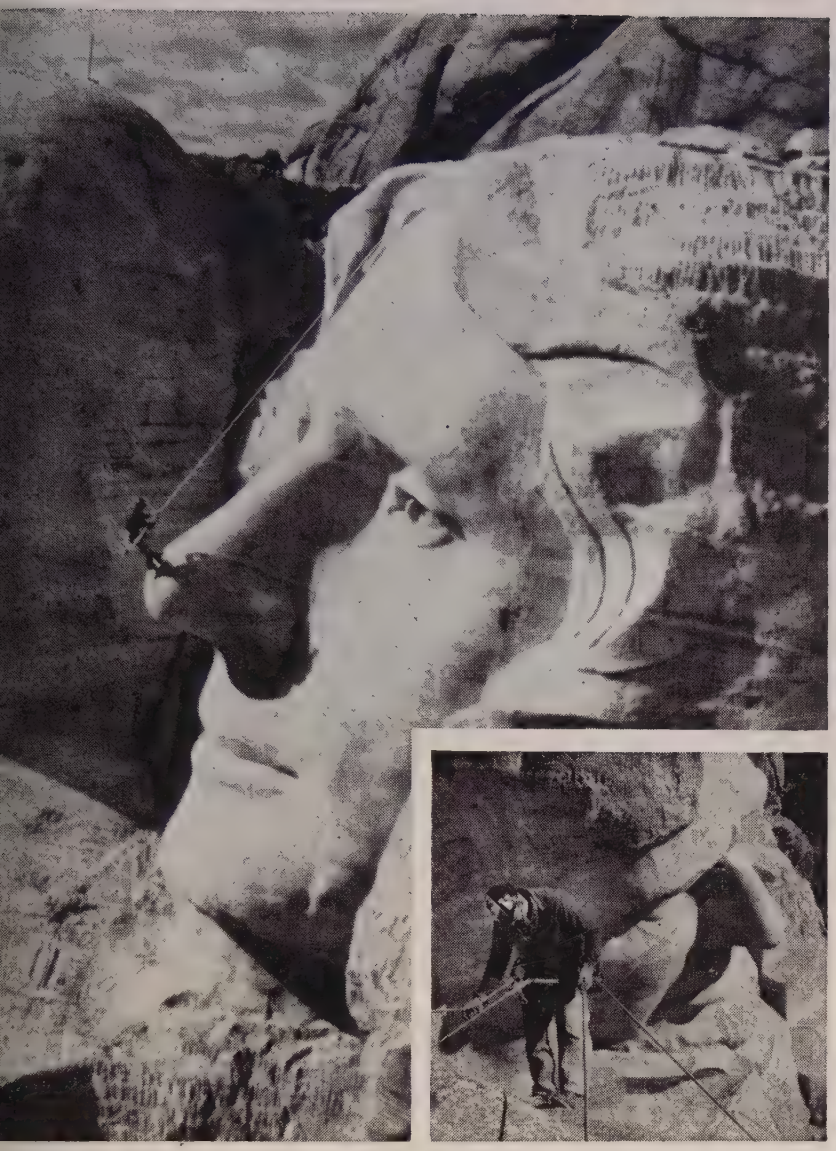
Tuffy Balanced Dragline Rope



Tuffy Balanced Scraper Rope

Tuffy Balanced Dozer Rope



Mount Rushmore National Memorial in South Dakota small fissures in sculptured faces of Washington, Jefferson, Lincoln and Roosevelt are g sealed with granite dust and white lead. Though the granite sculpture stimated to last for thousands of years, this preventive maintenance will o the surfaces smooth and slow the natural erosion process. The insert ws how workmen are suspended on Union Wire Rope.

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When you get him on the wire, you're sure to get the best in wire rope and slings—plus service that helps you get from Union Wire Rope products all the quality and long life Union builds into them. Union Wire Rope Corporation, 2146 Manchester Avenue, Kansas City 26, Missouri.

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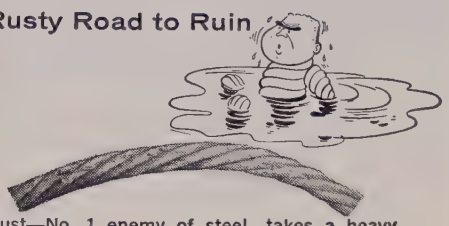
Rusty Road to Ruin



Rust—No. 1 enemy of steel—takes a heavy toll in wire rope life. The one-strand break shown here resulted when the rope was allowed to become rust-bound through lack of lubrication. Tests show that properly lubricated rope has up to 10 times the life expectancy of dry rope.

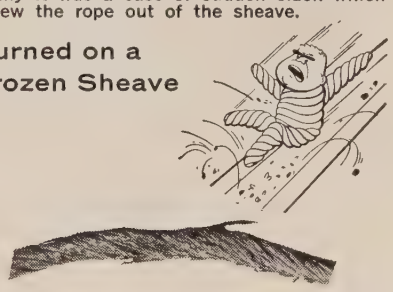
Crushed by a Tractor Cleat

The Sunday punch for this piece of wire rope was delivered by a tractor cleat—just one of many crushing injuries caused by rope being run over or banged into by hard, sharp objects. Even the toughest wire rope is no match for this kind of mistreatment.

After a Suicide Jump

This rope jumped out of sheave and was soon destroyed by pulling around the shaft. Actually it was a case of sudden slack which threw the rope out of the sheave.

Burned on a Frozen Sheave



End of the line came quickly for this rope as the result of operating over a sheave that did not turn. Note the exceptionally heavy abrasion on one side of the rope. Sheaves should be checked thoroughly and often.

Would you like a copy of a booklet in which more than a score of Tuffy Tips like those above are reproduced. If so, write Union Wire Rope Corporation, 2146 Manchester Ave., Kansas City 26, Missouri.

y Balanced gs and st Lines

2-C

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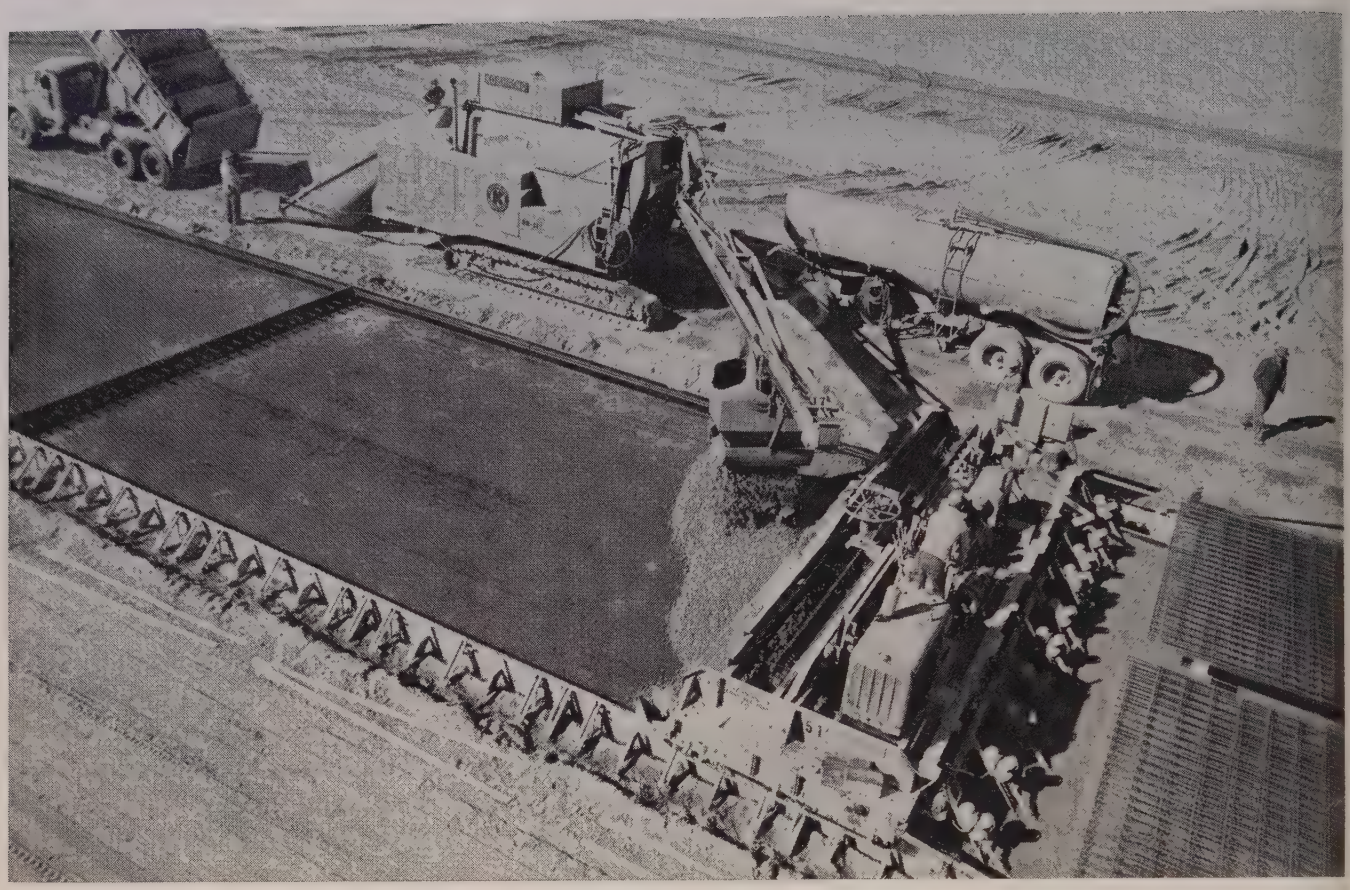


CONCRETE from Tribatch is spread with Blaw-Knox reciprocating spreader with spud type vibrators. Unit pulls frame holding re-inforcing mesh which is placed over 9-in. lift and covered by second 4-in. lift. Concrete is placed over a 6-in. layer of cement-treated subgrade.

brought to approximate finished elevation, steel forms 20 in. high are set for soil-cement and concrete paving operations. Material for the soil-cement course is placed between the forms, spread to approximate grade and then trimmed to a uniform level by a form-riding plane. Depth of material is regulated to provide for a 6-in. compacted lift. A Ko-Cal double-windrow former follows the plane also riding on the headers to scarify the material to the proper depth and forms it into two uniformly sized windrows. Cement is then placed in a furrow in the top of the windrow with a Wood cement tanker equipped with a variable speed drive screw-type distributor mounted on the rear. The tanker holds about 30,000 lb. of cement. Its distributor screw has two boots projecting from the rear of the truck, one on either side, so that it can apply cement to the windrows simultaneously as the truck is driven between them. Cement is applied at the rate of 5% to 6.5% of the dry weight of the material.

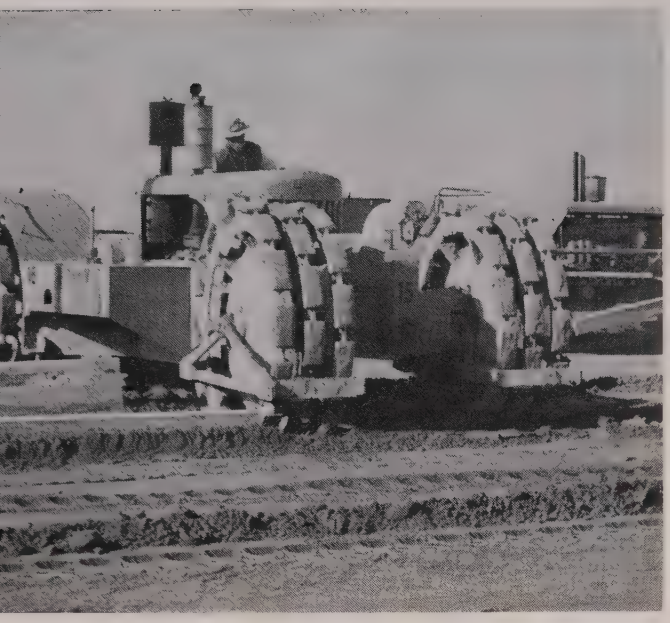
A single Pettibone Wood self-propelled pugmill windrow mixer follows behind the cement distributor and mixes the soil and cement together, adding water to the optimum level and re-depositing the mix in a windrow behind the machine. A motor grader behind the mixer re-spreads the material between the forms to approximate grade. About six passes are then made with a K-45 Buffalo-Springfield segmented wheel roller to compact the soil cement. The contractor has found it necessary to lighten the segmented wheel roller by removing all ballasts to avoid breaking down and over-compacting the soil. The planer or grade trimmer is again used to plane the cement-treated course to a uniform surface, and final compaction is done with a pneumatic tire roller. Best results have been obtained by removing ballasts from the pneumatic units and reducing tire pressure as low as possible without developing excessive tire wear. Specifications for the cement-treated course require a compressive strength of 300 psi. at 7 days. Originally, specifications called for an RC-2 curing seal applied in two applications, 0.25 gal. per sq. yd. and 0.15 gal. per sq. yd. However, this has since been changed to permit a single application of 0.18 gal. per sq. yd.

The native materials used for this course consist of a clean, fine sandy soil of fairly uniform gradation with 100% passing a No. 4 screen and about 50% ranging between the No. 40 and No. 80 screens. In some cases, the material was deficient in fines, and the contractor found it necessary to blend in materials containing higher percentage of the fines to obtain a better over-all gradation and reduce the amount of cement required. Cement contents have ranged between 5 and 6% with a maximum of 6½%, and in-place density tests have consistently ranged above 100%.

Concrete paving operations

Placement of the 170,000 cu. yd. of concrete on this project is of particular interest since much of the mixing is done with the Koehring Tribatch paver. This is the first major project on which the new triple drum paver has been used and, in fact, the machine is the actual pilot model of this line.

The principal features of the new mixer include a 3-compartment drum designed to provide faster cycling, greater capacity, and higher production than dual-drum equipment. Buckets and transfer chutes in the drums have been spe-



HEADER section removed to let Buffalo-Springfield segmented wheel roller enter for compacting soil cement, operating without weights or ballast.

CEMENT distributor truck meters cement to two windrows simultaneously. Boots are hinged to swing back for highway travel.

cially designed to provide for continual mixing, even during transfer, thus permitting the transfer time to be counted as part of the mixing time. Each of the three compartments holds 34 cu. ft. plus 10% overload, providing 50% more total capacity than dual-drum mixers. The unit is operated by automatic controls designed to relieve the operator of all work except for control of the boom, bucket, and paver movement. The skip raises and lowers automatically after the safety release has been activated by the batch-truck control man to provide faster skip operation. A positive pressure-injection-type water system employs a large hydraulically operated plunger which draws water into a cylinder with one stroke and discharges it into the mixer with the other.

This system gives accurate measure and control of the quantity of water. Water controls are located away from the operator's station so that no "eyeball" adjustments of water quantity can be made.

Generally, the Tribatch performs very well on this first big project. Minor mechanical difficulties were encountered in the early stages as are typically experienced in the first actual field tests of new machinery models. These have been largely overcome and the Tribatch regularly delivers about 2¼ batches per minute in comparison with 1½ batches per minute obtained with the dual-drum equipment on the project.

The Tribatch is one part of a complex and carefully integrated paving train used on the job. It is supplied from a Noble batch plant set up about a ¼ mi. away from the runway and midway between its ends. All materials are delivered to the batch plant by truck. Aggregates come from an alluvial deposit 14 mi. away. They are crushed and washed at the pit and delivered in bottom-dump trailers. Three sizes of aggregates are used, 1½ in. coarse, ¾ in. coarse, and sand. Similarly, the cement is delivered from a rail siding in bottom-dump truck tankers.

TYPICAL load-transfer dowel assembly placed at every third contraction joint in reinforced pavement.

Batched aggregates are delivered to the pavers by a fleet of 12 5-compartment dump-trucks. Each compartment holds materials for 1.42 cu. yd. of concrete.

Paving on 13-in. thickness is done in two stages to facilitate placement of reinforcing mesh. Heading the train is a Koehring Tribatch and Rex dual-drum paver which mix and place a 9-in. lift of concrete. They are followed by a reciprocating blade type spreader with spud type vibrators mounted in the rear, and a steel frame carriage carrying the reinforcing mesh.

A third dual-drum paver follows to place the top 4-in. lift of concrete over the reinforcing mesh. The paver is followed by a second spreader. A transverse vibrating screed finisher, and a longitudinal float finisher complete the train.

A Vibro-Joint Cutter follows closely behind the paving train and is used to form a depression in the fresh concrete and to force the larger aggregate particles away from the line permitting easier forming or sawing of transverse contraction joints.

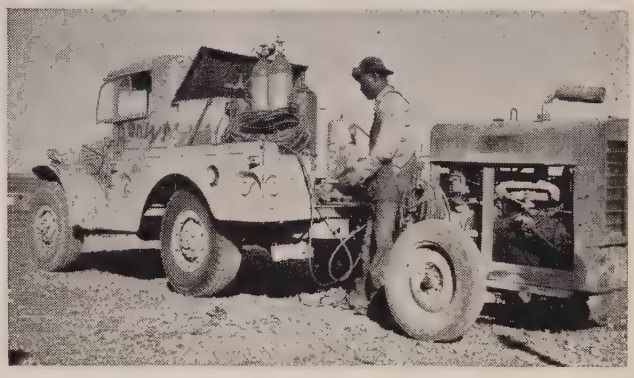
Specifications call for a strength of 600 psi. in flexure at 28 days. The contractor has had no difficulty in meeting this requirement with 5¾-sack mix mixed to a 1½-in. slump. Specifications permit use of non-air-entraining water-reducing admixture, if approved by the contracting agency.

Expansion joints

Complex expansion joints linked

6,000-GALLON WATERWAGON rolls on B.F.Goodrich Earth Mover tires. Note the unusual "button" tread. Hundreds of sharp edges bite into the ground to keep the tire from skidding or slipping. Yet the Earth Mover's wide tread keeps the tire on top of soft soil. Work stays on schedule.

HELPING COMPACT EARTH is the job of the 13 B.F.Goodrich smooth-tread tires on this road roller. Other Killian-House equipment includes 30 flat bed and water trucks, 10 scrapers, 15 maintainers, 30 pickups and 30 hydraulic dump trucks—all on B.F.Goodrich tires.



KILLIAN-HOUSE RELIES on B.F.Goodrich truck and trailer tires to move 200 amp. welding machine to equipment repair jobs. Altogether, this contractor uses nearly 800 B.F.Goodrich tires to help speed highway construction in Southwest Texas.

eep highway construction on the go

ILLIAN-HOUSE, one of the biggest highway and bridge construction companies in Texas, operates out of dquarters in San Antonio—maintains three field offices n 2-way radio hook-up to help service jobs currently th more than twelve million dollars.

very day a fleet of 143 units goes to work on .Goodrich tires—scrapers on Rock Service tires, dump cks on the Traction Express, maintainers on Power der tires, water trailers on Super Traction tires, kups on the Power Express—even company cars on .Goodrich Life-Saver Tubeless tires.

Why this vote of confidence in B.F.Goodrich? "Because," says General Superintendent Glen Quick, "they are the best tires for the job. For example, we once got only 30,000 to 50,000 miles from truck tires. Costs were enormous. Now B.F.Goodrich Traction Express tires give us 60,000 to 90,000 miles, cutting our costs in half."

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1 Michigan Model 480 pusher
6 Michigan Model 310 scrapers
4 DW-20 Cat scrapers
1 14 T D Euclid scraper
1 D-6 Cat scraper
4 Model 12 Cat motor graders

TRUCK CRANE

1 Lima 50 ton
1 Bay City 25 ton
1 Austin Western Hydro Crane

PAVING

1 Koehring Tribatch paver
2 Rex dual-drum 34-E pavers
2 Blaw-Knox concrete spreaders
1 Blaw-Knox transverse finisher
1 Rex longitudinal float finisher
1 One-stop Noble batch plant

WATER TRUCKS

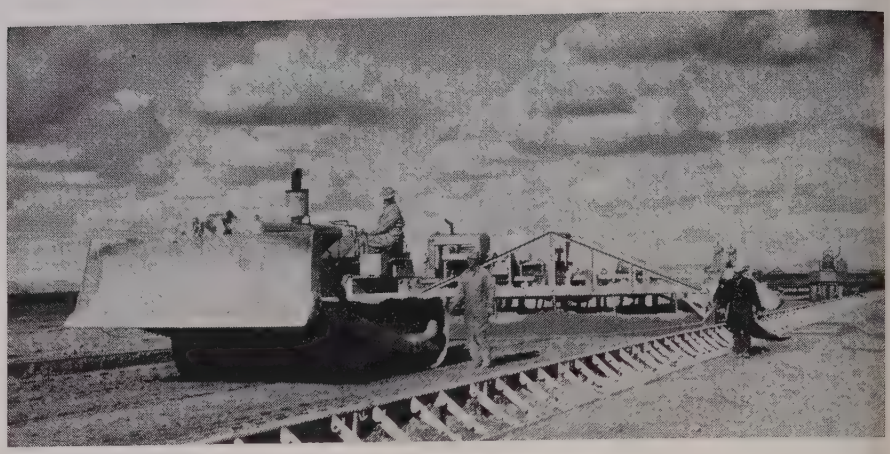
3 Euclid mounted 5,000 gal.
2 Truck mounted 3,500 gal.

ROLLERS

3 Essick VR 72 vibratory
1 Buffalo-Springfield K-45
1 Roscoe Wobbly
1 Southwest 50 ton

MISCELLANEOUS

1 Model 125 Michigan loader
1 Ko-Cal twin windrow sizer
1 Lewis subgrader



FORM-riding planer leads the paving train. It trims base course to ¼ in. above grade prior to windrowing and cement treating.

DOUBLE-windrow former used to pick up and proportion soil into windrows. Machine rides on the leaders, and is pulled by a tractor. Note plow-like ripper teeth.

by special steel dowel assemblies are placed at 225-ft. intervals on runways and taxiways. Joints are made with load transfer dowels with 1¼-in. bars on 10-in. spacing along with a ¾-in. thick compressible asphalt impregnated fiber board. Dowels are covered with metal sleeves alternating from side to side along the joint.

Transverse contraction joints are installed at 15-ft. intervals. In the reinforced section load transfer dowels are installed in every third contraction joint. Dowel assemblies are the same as those used on expansion joints except that expansion sleeves and the center fiber strip are omitted. A longitudinal contraction joint is cut along the center line of each 25-ft. lane.

Construction joints between lanes are of conventional keyed type without tie bars except on the outer lanes which are tied to the adjacent inner lane. Reinforcing mesh is placed on all taxiways and in the first 1,000 ft. at either end of the main runway. Mesh consists of No. 0 gauge wire on 12-in. centers transversely, and No. 1 gauge wire on 6-in. centers longitudinally.

The contractor elected to hand-form all transverse joints in the initial stages of the work. This was changed after completion of the first lane, however, and the contractor now is sawing transverse contraction joints as well as the longitudinal joint at the center of each lane. The cuts are ⅜ in. wide and are filled with a 2-component polysulfide rubber joint sealer.

Averaging 3,300 ft. of cement-treated base and concrete placement a day, the contractor paves a full length runway lane every four days. This meets the schedule planned for the project.

Subcontractors

Miles & Son, Inc., Merced, Calif., has the subcontract for hauling dry batch material from the batch plant and for spreading and mixing the soil cement. Harlon Thompson is the Miles superintendent on the project. Marin Rock & Asphalt Co., Novato, Calif., has the subcontract for producing and hauling aggregates. Superintendent is Carl Miller. Application of the membrane curing compound, sawing of joints, and filling of joints is handled on a subcontract by Hunt's Process Co., Los Angeles.

Personnel

Nelson "Pat" Richardson is project manager, and George L. Cavanaugh is project engineer for the prime contractor, Sundt and Bevanda. Ed Sheehe is field engineer; M. M. Yeary, concrete superintendent; Banks Bourguess, master mechanic; Bob Huskey, soil cement foreman; and Mark Lund, office manager.

Navy field supervision, inspection, and engineering forces on the project are under the command of Lt. Cmdr. T. H. Cushman, USN, CEC, Resident Officer in Charge of Construction and Public Works Officer for Vincent Field, MCAAS. Lt. J. M. Weis, USN, CEC, is Assistant Resident Officer in Charge of Construction. R. J. McCarthy is project engineer and W. Speedy, chief inspector.

Field sampling and testing is performed by Porter, Urquarht, McCreary and O'Brien, with Jack Noe as superintendent.

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WITH A TOTAL length of more than 1,400 ft., this additional width will 4-lane an overpass.

Getting rid of the railing when you 4-lane a bridge

Ingenuity by the contractor solves a problem in the addition of two lanes to an overpass structure.

ADDING TWO LANES to a long railroad overpass near Tracy, Calif. presented the contractor with the not unusual problem of demolishing and removing the railing and sidewalk of the old structure to provide the clear 4 lanes. Charles MacClosky Co., general contractor, with Ed Surufka as general superintendent, developed an ingenious method of carrying out this operation. Breaking it loose with jacks in 40-ft. sections, and removing these in 15-ton sections did the trick.

The project was the construction of a new bridge 1,441 ft. long on U. S. Highway 50 passing over the Southern Pacific Railroad tracks at Tracy. With the additional width provided by the new contract, the overpass will represent a clear roadway width of 52 ft. for 4 lanes of highway traffic. The new structure was scheduled to be opened for traffic this month.

A special design problem for the bridge department of the California Division of Highways was to secure adequate clearance for the new bridge above the railroad tracks, and at the same time retain the elevation of the highway grade in order to utilize and connect with the existing 36-span bridge. The new addition consists of 28 reinforced concrete T-beam spans and six steel girder spans. More than 260 steel bearing piles 72 ft. long were required to support the new bridge piers.

Because of the proximity of the pier footings to the main line tracks of the Southern Pacific railroad, the contractor drove 10-in. BP 42-lb. steel shoring piles on 6-ft. centers. These piles supported the tracks during foundation excavation, with 4x12-in. horizontal lagging driven down between the flanges of the piles. Main line railroad traffic was not delayed or inconvenienced during construction.

Forms for the concrete piers were prefabricated out of ⅝-in. plywood, and the contractor secured eight re-uses of these forms. Timber falsework consisted of 8x18-in. stringers on 10x10-in. caps and 8-in. posts. This system supported the concrete for girders and slab. Specially designed 2x6 jacks with ½-in. tension rods at 8-ft. centers provided support for the 4-ft. overhanging curb and sidewalk on the outside of the new addition.

The new concrete railing was built with three sets of plywood forms which were coated with bolt resin to provide a fine surface. There are 12 re-uses secured with these railing forms.

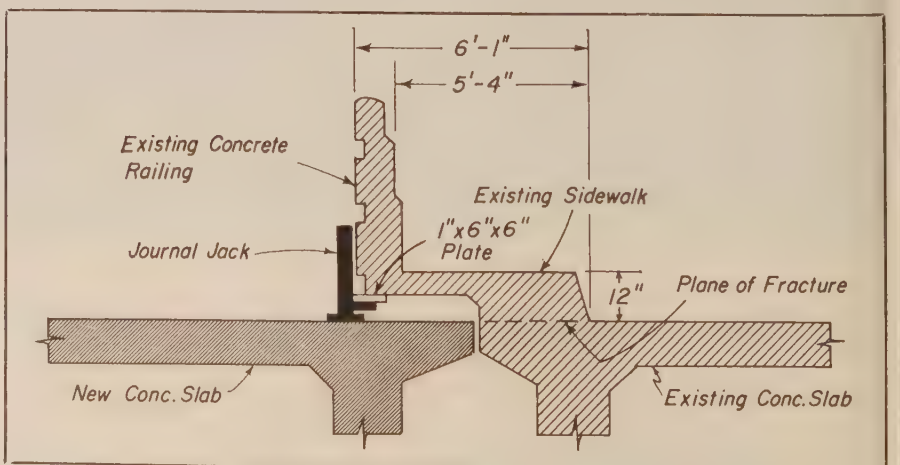
To obtain clearance above the main line railroad track, continuous welded steel girders 42 in. deep were specified. These were shop fabricated in 106-ft. sections and hauled to the job site. Here they were placed in position by two P&H 35-ton truck cranes.

Removing sidewalk and railing

Removal of the existing sidewalk-curb and concrete railing from the old structure was required as part of the job to secure the necessary unrestricted 4-lane width for the final roadway. Obviously, the job was not complicated or unusual, but the trick was to get it done efficiently and economically without having to completely demolish it and remove it in small pieces.

The contractor developed an ingenious procedure which proved most effective. The first step was to use pavement breakers to expose the reinforcing steel in the face of the curb before cutting this steel with a torch. After all the reinforcing steel had been cut, a 50-ton railroad journal jack was inserted under the outer edge of the old sidewalk and rail (see accompanying sketch). This old concrete had been placed in 40-ft. pours which represented a unit to be broken up and handled at one time.

(Continued on page 89)



METHOD of breaking loose the existing sidewalks with a jack on the new structure. The effectiveness of this procedure is shown in the picture on page 89. All rebars were cut before jacking.

SECTION of sidewalk and railing tipped over from its original position onto the new addition and ready to be removed as a 40-ft. unit weighing 15 tons.

DIRECTING the work is Ed Surufka (left) general superintendent for Charles MacClosky Co. with his assistant Reuben Sell. On the right is Jack Morse, resident engineer, Division of Highways.

The jack which was supported directly over the column was then raised about 2 in. During this raise, the railing and sidewalk acted as a concrete beam and broke loose from the existing concrete deck for about half of the 40-ft. span length. Then, the jack was released and the other half of the rail and sidewalk broke loose for the remainder of its length. Thus, the entire section of railing including the curb-sidewalk was cleanly and completely separated from the old bridge deck, ready for removal.

These 40-ft. concrete sections weighed about 15 tons apiece and, using 3-in. steel rollers, they were loaded on to the contractor's low-bed trailer. Hauled to a disposal area, they were quickly unloaded from the low-bed by a sudden forward movement of the tractor hauling the trailer.

Personnel

Pile-driving for the job was carried by Ben C. Gerwick, Inc. Concrete was supplied by Gonzales Transit Mix. Stanfield & Moody is constructing the road approaches on the project which consist of plant-mix surfacing on cement treated base. All of the steel work was performed by the San Jose Steel Co., Inc.

Resident engineer for the California Division of Highways was Jack Morse.

For the Charles MacClosky Co., general contractor, Ed Surufka is superintendent, with Reuben Sell, assistant superintendent.

LIABILITY

(Continued from page 67)

by the rule that a minor defect does not of itself, by continued existence, raise a presumption of constructive notice.

Constructive notice sometimes is proved by evidence of previous accidents at the same place caused by the same defect as well as the length of time the defect existed and its notoriety.

AVAILABILITY OF FUNDS, MEN AND EQUIPMENT: The cases in California have not said too much on this subject. The statute providing for suits against public officers has several limitations on this point. The statute requires that funds must be immediately available to the public officer who had the duty to remedy the condition. The statute also requires that the public officer be able to remedy the condition. The net result of these requirements is that the public officer must have the means at his disposal to make the necessary repairs or take the required precautions before he can be held responsible for an accident arising from a dangerous or defective condition of public property.

CONTRIBUTORY NEGLIGENCE: Contributory negligence is a defense with which nearly all persons are familiar, but the rules relating to it are not nearly so familiar.

Contributory negligence (in one form or another) is an effective defense to all tort actions under consideration in this discussion. Simply put, it is described as negligence on the part of the plaintiff. Ordinary negligence is based upon a duty owed by the defendant to the plaintiff. Contributory negligence is based upon a duty owed by the plaintiff to himself, e.g., a person using a street or highway is bound to use reasonable care and prudence for his own safety.

If he does not do so and his failure contributes materially to the damage suffered by him, he is precluded from recovery.

In suits against public officers, contributory negligence enters into the case in a different form. There, the plaintiff must prove that he was using the street or highway with due care. This means that he has the burden of proving that he was free from contributory negligence. Along this same line, it should be noted that the plaintiff must also prove that the street and highway were being carefully used at the time of the accident.

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Ripping tough rock at Whitlow Dam

Tandem crawlers pull ripper and load scrapers out of gear on tough spillway cut at Corps of Engineers Whitlow Dam flood control project in Arizona's Superstition Mountains.

AT THE EDGE of the barren foothills of the Superstition Mountains where the dry stream bed of Queen Creek emerges to lose itself in the desert, the Corps of Engineers is building an earthfill dam with a hole in it.

This structure, Whitlow Ranch Dam, is part of the Corps' flood control program, and if you think a flood control dam on a dry wash at the edge of the desert is possibly non-essential kindly do not mention it to the contractors engaged in the first stages of construction at the site. They were flooded out twice in two months last fall when two separate flash floods roared down the canyon, sliced through an earth cofferdam, mangled a 54-in. by-pass culvert, filled the core trench with mud and buried a D8 along with a couple of utility trucks and miscellaneous equipment items.

The dam is designed with a hole in it (a concrete outlet tube running through the base of the fill and having no gate) because that's the only way you can build a dam in Arizona without a trunkfull of water rights and the unanimous agreement of the downstream water users. Arizona is so dry that even the water is only half moisture, and every drop that falls, that has fallen, or that will fall is divided among its owners on the basis of claims for water usage. These water rights take precedence in order of age, and it is said that the first settler wrote out his claim for water while standing off a party of Apaches seeking to enforce their hereditary rights to his scalp.

It isn't practical to build a surface reservoir to hold flood runoff, since floods are so widely spaced that the dam would be dry most of the time. Users prefer to let such runoff percolate into the ground to replenish the water-table or flow downstream to major installations on full-time water courses.

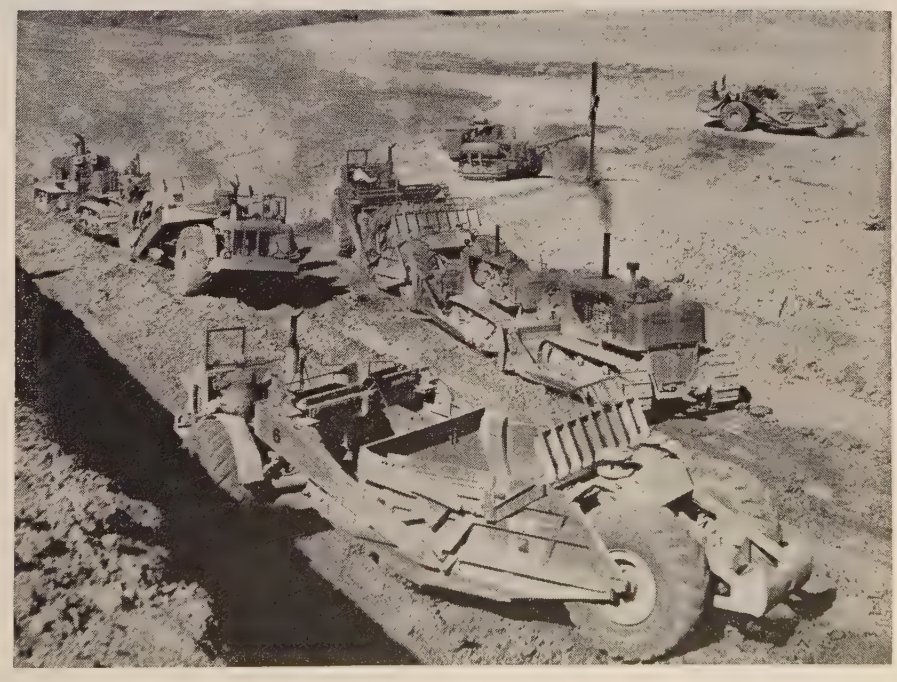
There remains, however, the little problem of the flash flood which occasionally causes Queen Creek to flow deep enough to drown a tall turkey on a barn roof.

The Engineers' solution is an ungated earthfill structure designed to hold back stream flow to 1,000 cfs. compared to a whopping 110,000 cfs. which could occur after a storm of maximum magnitude the dam is designed to handle. Reservoir area behind the dam will hold 36,000 ac. ft. which would require three weeks to flow through the outlet.

The dam itself is a rolled earthfill 149 ft. high from stream-bed and 840 ft. long at the crest. Its core of impervious material will extend 40 ft. below ground level and contain 100,000 cu. yd. of material. About 600,000 cu. yd. of pervious material will be placed on either side of the core. The upstream face and the downstream toe will be protected with riprap.

Project also covers an unregulated spillway cut in a saddle about ¾ mi. north of the dam. This cut is 355 ft. wide, about 2,800 ft. long,

(Continued on page 94)



DOUBLE pushers load scraper fleet in nearly completed spillway cut. Out-of-gear loading doubles scraper tire life. Drill rig, center, prepares rock ridge for blasting.

J. P. Surace Company... Raising

C.I.T. Is On The Job, Too!

It takes special ingredients to raise the speed limit—legally—of an old winding road. The J. P. Surace Company of Seattle, Washington, has them: heavy roadbuilding experience, a modern equipment fleet and working capital. This contractor recently widened, straightened and eased the grades on a segment of Washington's U. S. Highway 101 in the Peninsula area. The legal speed limit went up to 60 miles an hour, compared to the old horse and buggy 40 m.p.h.

Established in 1939 the Surace Company has a steady record of growth and progress. "C.I.T. people," says Mr. Surace, President, "work closely with the contractor; they know his ability. In my own ca I use the services of C.I.T. two ways—one for buy heavy equipment, the other for working capital. all times, C.I.T. has given me prompt service by f nishing the capital when I need it most."

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In addition to equipment purchase financing, C.I

(*left to right*) J. P. Surace, Sr., J. P. Surace, Jr. and C.I.T. representative A. D. Keith looking over the progress of this road job. Young Mr. Surace takes a keen interest in studying engineering and business methods. Top picture shows two massive pieces of Surace equipment on the job.

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n help improve contractor's bid and bond capacity, eet current operating expenses or other business eds by arranging capital loans. C.I.T. representaves know how to lay out "job-engineered" finance ans, carefully devised to fit the needs. Why not call write today. No obligation, of course.

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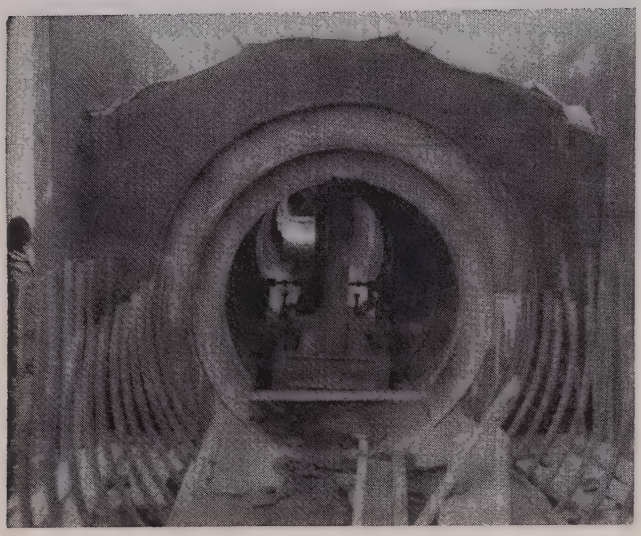


OUTLET tube section with interior form and carrier in place. Single hinge steel form is positioned with turnbuckles.

SUPERINTENDENT Arch Martin holds continuous rubber waterstop held in place by plywood template. Curved rail guides invert screed.

and up to 60 ft. deep. It requires excavation of about 600,000 cu. yd.

Contract for the project was awarded to Wells & Stewart of Las Vegas, Nev., on a low bid of $1,225,-086. Early excavation of the spillway was sub-contracted to Bonner Construction Co. of Phoenix.

Spillway

Geology of the cut area is officially described as a contorted schist, brown weathered and soft near the surface, ranging to hard grey rock at the bottom of the excavation area. In this description, the Bonner forces heartily agree. They elected to rip the material and move it with rubber-tired scrapers. Ripping was done with a LeTourneau - Westinghouse K30 ripper frame pulled by a Caterpillar D8 and pushed by an Allis-Chalmers HD21 or HD16. Material was moved by a fleet of 6 Allis-Chalmers 360 two-axle scrapers and an International Harvester and Michigan scraper of comparable size.

In the early phases, the big ripping unit was able to handle the material without difficulty. As the cut developed, however, the rock became denser and harder to break. The contractor piped water from the stream (which flows during the winter months) using about a mile of 6-in. irrigation pipe to wet down the cut area. Schist slakes in the presence of air and water, eventually deteriorating to a clay-like substance. By irrigating the cut, the contractor softened the rock and made cutting easier. The ripping spread frequently worked two shifts in order to keep ahead of the scraper fleet.

Scrapers were double-pushed by D8's and HD21's to load, and even this healthy shoving took a minute or more to scoop up a partial load. In the dense rock, pushers would lift the rear wheels of the scraper clear of the ground, and really drive the cutting edge into the material.

Several areas of the particularly tough rock were encountered which could not be ripped, and the contractor brought in a LeRoi drill mounted on an International TD14 to drill the hard spots for blasting. Ripper continued to operate in the softer areas, and the scraper fleet loaded both shot and ripped material. When the shooting started, the water had to be cut off, and this didn't help things any for the scraper spread.

Wear and tear on the equipment was plentiful in the rock pile. Superintendent Robert Hall noted that grousers melted away, ripper points lasted 1 hour, cutting edges were replaced at frequent intervals. Ripper shanks broke and were field welded, and 3 or 4 moldboards on the scrapers broke and were rebuilt in the field.

Tires also took a beating, lasting only 300 hours when scraper operators used their own power to load. Hall switched to loading out of gear, increasing tire life to 500-600 hours. This represented a considerable savings. Tires on the earth-moving units cost $1,800 new, and about $1,000 for recapping. Tires were inspected and serviced on the job by Bob Taylor of General Tire Co., Phoenix, who was assigned to the project full time. He noted that tires can be recapped indefinitely if the carcass is not damaged.

When the spillway cut is completed, total blasting will probably run 75,000 cu. yd. Material from the spillway is wasted in a nearby disposal area, its composition being unsuited to use in the dam itself.

Outlet structure

The 700-ft. concrete outlet structure is handled on another subcontract by Givens Construction Co., Phoenix. Inside diameter of the gateless tube is 66 in. It extends from an upstream block-like intake structure and trash-rack to the outlet where a small gate is installed to divert 6.25 cfs. in fulfillment of a local water right.

The outside of the concrete tube structure is shaped like the gable end of a house, with vertical sides and a flattened peak top. Although the bore is constant, exterior dimensions vary from a width of 8 ft. and top thickness of 15 in. at both toes to a maximum of 10-ft. width and 27-in. top thickness at the center.

Tube is formed in two lifts with a curved invert and foundation placed first, followed by the top section placed in lengths of 15 to 20 ft. Curve of the invert is formed with longitudinal screeds working on job-made curved templates spaced about 10 ft. apart.

Continuous rubber ring waterstops which will seal the cold joints between sections are imbedded in the invert. They are held in position by plywood templates, one on top and the other beneath the waterstop, which form the end panels for the sectional pour. Resteel bars

also are imbedded for part of their length in the invert, and protrude like ribs from the concrete. The invert of the tube is built up above the foundation to form a keyway along either side.

Steel forms on wheeled carriers made by Garland Steel Co. form the inside of the tube. The hinged forms are positioned by turnbuckles joining their lower edges which overlap the invert curb a few inches. Outside of the top section is formed with wooden panels. These, placed outside other form elements are re-used for sections of varying length and height. Waterstop rings partially imbedded in the invert are positioned for the top section with ring-like plywood templates which again make up the end forms.

Concrete for the tube is dry-batched at a portable plant set up outside the canyon (and out of the flood zone) about a quarter-mile away. It is delivered by two transit trucks and bucket-placed with a Michigan 25-ton carrier crane.

Batch plant includes an Autocrete dry batch hopper-scale unit, and a self-loading silo for storing and metering cement. Aggregate bins are filled with a wheel loader from nearby stockpiles.

POURING invert section of outlet tube with Michigan truck crane. Transit-mix concrete is delivered with two trucks. Invert is hand finished. Note waterstop in foreground.

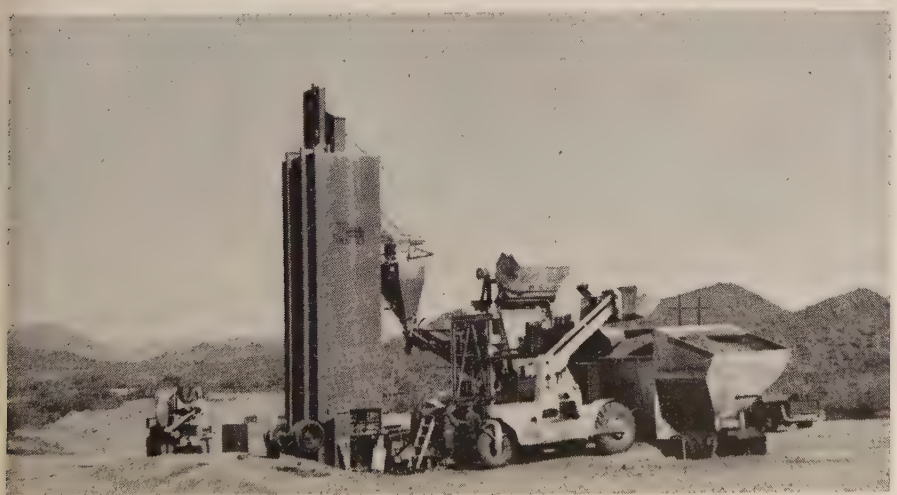
Earth fill

Peterson Construction Co. of Logan, Utah, was awarded a subcontract for handling the earth fill on the dam. The pervious zone material is being moved by a spread and rock in the stream bed. Material is being moved by a spread of Caterpillar equipment made up of 4 DW20's, 3 DW21's, and 2 D9 pushers. Compaction is accomplished by a 50-ton Bros pneumatic roller pulled by a D8 tractor. The same spread is used to load and haul the impervious material which is pre-wet by sprinklers in the pit.

Early stages of the fill operation presented a water problem. Approximately 15 cfs. was brought to the surface by the impervious core. Water level was dropped by using a John W. Stang 10-in. wellpoint pump. Clay and gravel zones were brought up simultaneously to an elevation higher than the conduit intake structure. The pump then was removed and as the water level rose it was diverted through the outlet conduit, and the embankment operation proceeded in the dry.

Progress on the opening phase of the project — excavation and backfilling of the core trench—was delayed (as a matter of fact, it was brought to a grinding halt) by two floods in October and December. Trench was being excavated between two earth dikes, one upstream and one downstream, connected by a long 54-in. corrugated metal bypass culvert set up to handle the runoff from occasional rains. On Oct. 30, the "occasional" rain totalled 3.75 in., a once-in-100-years storm. Flow at the dam site reached 8,000 cfs., which swamped the dike and the partially excavated core trench. Compressors, dewatering pumps, and other equipment were destroyed. A Cat D8 also caught in the flood was salvaged and sent to the dealer's shop for complete rebuilding.

The whole event was repeated again in December, with little damage since by that time the core trench had been excavated, grouted, and back-filled. However, the flood did make rusty junk of a utility truck and compressor.



PORTABLE batch plant set up below dam loads transit-trucks delivering concrete for outlet structure. Aggregate bins fed by loader, cement silo at left includes elevator for self-loading.

Personnel

For Wells & Stewart, general contractor, key men are Harold Stewart, project superintendent, M. E. Dansie, engineer, and Bill Kinginger.

For Bonner Construction Co., earth-moving subcontractor, field superintendent is Robert Hall.

Paul Lindsay is superintendent for Peterson Construction Co., dam embankment subcontractor, and Dave Carter is project manager.

For Givens Construction Co., concrete subcontractor, superintendent is Arch Martin.

For the Corps of Engineers, project engineer is Harry Althaus. Arizona Area Engineer is W. S. Alldredge. Project is part of the Los Angeles district under command of Col. C. T. Newton.

Now!...Euclid Twin-Power

*heaped capacity at 3:1 is 16 yds., at 1:1 slope, 20 yds.

HERE'S BIG NEWS for scraper users. The many cost cutting advantages of all-wheel drive are now available in a medium-size scraper, the Euclid Model TS-14. With Twin-Power and a total of 296 h.p. this new "Euc" has already proved itself an outstanding performer. A one-man, one-machine earthmoving spread, it gets more work done at lower cost than any other scraper of comparable size . . . its high productive capacity brings a better return on investment.

Like the widely used 24 yd. "Twin", this new Euclid has a separate Torqmatic Drive and power train for each axle. It self-loads in practically any scraper material and with a pusher is a big producer on even the toughest jobs. There's plenty of power and traction to pick up a heaped load in a hurry . . . pull out of the cut fast . . . and highball on the haul and return.

The TS-14 works on grades and under adverse job conditions that stall other scrapers. Its ability to do a wide range of work — without pusher assistance — makes it the most versatile scraper in its class. This new "Twin" can lengthen your work season and give you a bidding advantage on that next job. Get the facts and figures from your Euclid dealer.

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Check the advantages of all-wheel drive in this new 14 yd. Twin-Power scraper!

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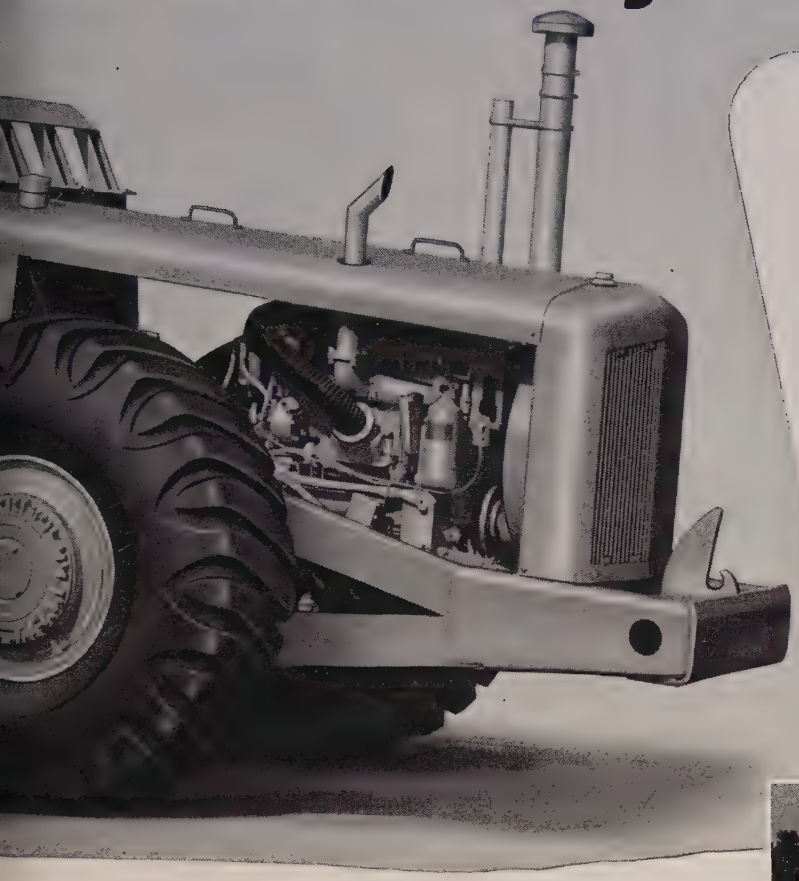

TS-14 features that cut dirt moving costs

2 engines — 296 total h.p.
all-wheel drive
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converter lock-up
20 yds. heaped
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All-wheel drive and 296 total horsepower enable the TS-14 to get heaped loads without pusher assistance . . . make it a one-man earthmoving spread with more versatility than any other scraper in its class. Low wide bowl and four-section cutting edge speed loading and cut cycle time . . . blade sections are identical, adjustable and reversible.

The TS-14 works independently of other equipment . . . in the cut and on the fill . . . has the power and traction to self-load fast and work under adverse grade and job conditions that stop single engine scrapers. Its versatility and work-ability make this new "Euc" a top performer for low cost dirt moving on any scraper job . . . big yardage projects as well as close quarter work where concentration of equipment isn't practical.

Separate Torqmatic Drives for each axle provide a smooth, steady flow of power. There's no clutching, no delay, and no loss of momentum when changing to any of the 4 forward speeds . . . speed changes are made by a simple flick of the wrist at the air assist remote control lever. Converter lock-up assures maximum efficiency on grades and long hauls . . . this direct drive provides more usable power from each engine.

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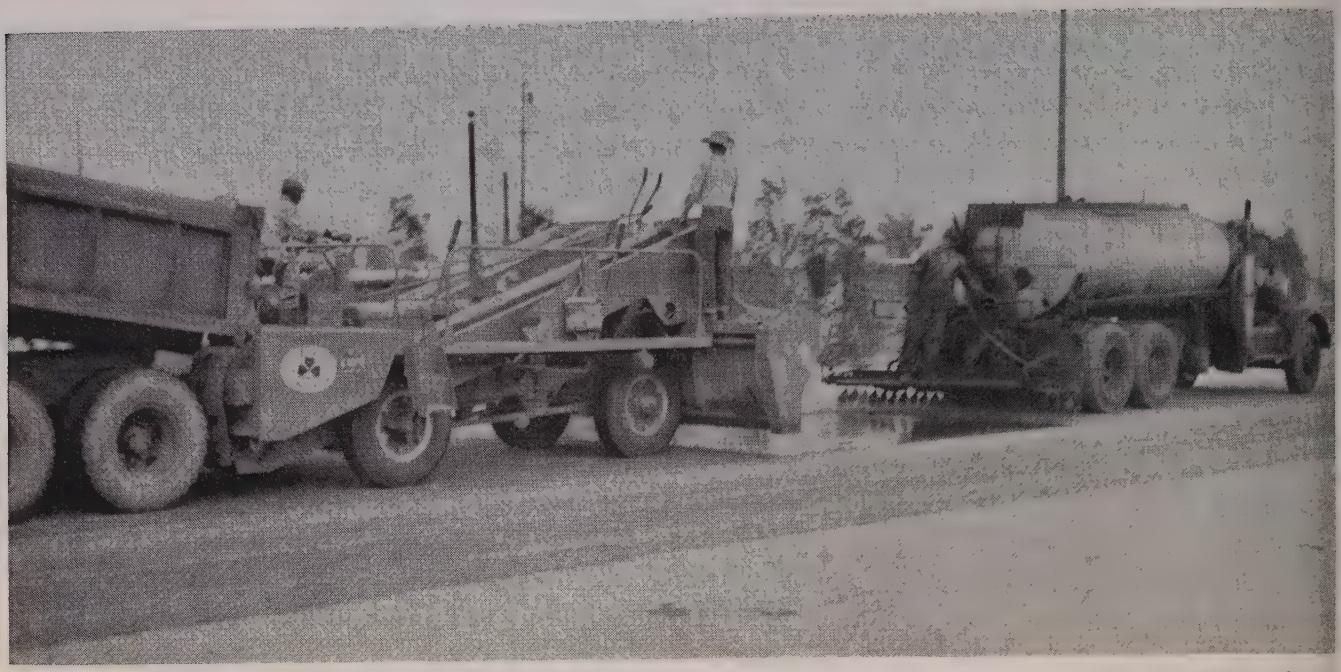

SEAL-COATING train with distributor placing Cationic Bitumuls at 140 deg. and a rate of 0.25 gal. per sq. yd. It is followed by the self-propelled Flaherty chip spreader. This unit permits spreading to proceed without interruption while the rock truck is changing.

How to handle the damp-day problem during seal coating

By JACK NEWCOMB
Administrative Engineer
Riverside County Road Department
Riverside, California

THERE ARE FEW areas in these Western states that can offer better climatic conditions for chip seal coats than Riverside County in Southern California. Its desert areas, stretching more than 100 mi. from the resort areas of Palm Springs to the Colorado River, are warm and dry the year around.

The San Jacinto Mountains, though reaching an elevation of over 12,000 ft., have warm, dry summers with few thunder showers. The most populated section in the valley of the Santa Ana River has consistently warm summers with virtually no rainfall between May and October. Only occasionally, during summer months, do coastal fogs extend inland to pose a threat to aggregate retention.

For several years the county road department has conducted an extensive seal coat program with ever increasing success. County crews have become skilled in the handling of seal coat equipment and the efficiency of the operation is excellent. As is the case in all good construction operations, this efficiency is not the result of chance, but is a tribute to the organizational skill of Road Superintendent R. H. McKenzie, who has instilled in his crews a great sense of pride in their work.

Emulsified asphalt binders, being ideally suited to the climate of Riverside County, have been used throughout the seal coat program. Early work was done with RS-1 grade, changing to RS-2 in 1955 to take advantage of the higher viscosity available.

By 1959, the program had grown to the extent that about 110 mi. of county roads were being scheduled for sealing each year. Failures in seal coating have been rare and limited to a very few isolated cases where cool-damp weather had suddenly appeared and caused a delay in the dehydration of the emulsified asphalt binder.

In 1958, the American Bitumuls & Asphalt Co. went into production of Cationic Bitumuls. We found this binder to be unique in its ability to set electrolytically, virtually eliminating waiting for dehydration of the water vehicle. This allows its use in cool and damp weather, and with wet stone. To Riverside County this meant possible insurance against the one primary source of trouble in our sealcoating—sudden coastal fogs.

In 1959, the county asphalt emulsion contract was awarded to American Bitumuls for 2,000 tons of RS-2 and/or Cationic RS-K. Near the end of August, the coastal fog appeared in the valley of the Santa Ana River where crews were sealing with RS-2, so it was decided to switch over to the Cationic RS-K.

Starting temperatures on this job were often in the low 60's with overcast until noon or later. Further complicating the dehydration was the fact that many roads were completely shaded throughout the day by overhanging trees. In addition, some streets had water in gutters and running across the pavement. However, in all cases, we discovered that the seal coat achieved was excellent, demonstrating the ability of the Cationic Bitumuls to hold cover stone under conditions where other binders had failed.

Use of the material was continued for about another 25 mi. of road. At this time the crews moved to the desert areas where the special properties of a Cationic product were no longer required.

Construction details

Most surfaces were unsealed road-mix between two and ten years old. Two areas were asphaltic concrete. All pavements were dry-swept during the week prior to sealing.

The Cationic Bitumuls was applied to all surfaces at a rate of 0.25 gal. per sq. yd., at a temperature of about 140 deg. Spreader

(Continued on page 102)

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Model H-90 Series B

CAPACITY: Operating . . . . 9,000 lbs.
Peak Lift . . . . 18,000 lbs.

NEW ENGINE: New, powerful Cummins Turbo-charged diesel engine develops 162 hp at 2,100 rpm. GMC Diesel is optional—develops 153 hp at 2,200 rpm.

MORE STABILITY: Wheelbase is extended and wheel tread is widened which, along with greater machine weight, greatly increases the balance and stability of the machine for ANY working condition.

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MORE STRENGTH: Front axle, main frame and other structural parts have been strengthened to meet the greater work potential of which this machine is capable.

TRANSMISSION AND TORQUE CONVERTER: Major improvements have been accomplished in the full power-shift transmission and the torque converter, resulting in superior throttle response and operating characteristics.

AIR BRAKES: New air brakes are standard equipment and give more positive action with less operator effort than ever before.

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Model H-70 Series B

CAPACITY: Operating . . . . 7,000 lbs.
Peak Lift . . . . 13,000 lbs.

MORE POWER: Available with a larger diesel engine (Cummins 124 hp). Also available with IHC gasoline engine of 110 hp, and GMC diesel engine of 105 hp.

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FOLLOWING immediately behind the application of the emulsion is the self-propelled Spreadmaster. Chips are elevated from the truck-filled hopper and feed at 18 lb. per sq. yd.

TEXTURE of the seal-coat cover over the Bitumuls. The chips are washed, 3/8-in. to #6 crushed stone conforming to the California Division of Highways specifications.

trucks were equipped with a Jones-type full-circulating spreader bar. This operation is identical to that normally used with other emulsified asphalts.

Cover stone was spread immediately with the county's Flaherty Spreadmaster, a self-propelled chip spreader which allows rapid and accurate placement of stone. Its ability to allow the switching of rock trucks without stopping, permits the Spreadmaster to follow the asphalt spreader closely without requiring the seal coat train to stop.

Cover was a washed 3/8-in.x#6 crushed stone conforming to the California Division of Highways specification for medium seal coat. It was spread, surface damp, at the rate of approximately 18 lb. per sq. yd. Rolling was accomplished with a 5-ton steel tandem on early work, and a pneumatic-tired roller on later work. No marked difference was noted.

No attempt was made at traffic control, as, with few exceptions, traffic was relatively light. However, this lack of traffic control underlined the advantage of the quick set of the RS-K. In the few areas where traffic was heavy and followed closely behind the seal coat train, no serious disturbance of the mat was encountered.

A recent inspection, after several months of use, shows all sealed areas to be in excellent condition. We know that on many of these roads, RS-2 emulsion might have given equally good results. However, the climatic conditions encountered were the same as those which had given trouble on RS-2 work in the past, and the Cationic RS-K eliminated the risk.

Bid depository formed for San Diego County

FORMATION of the Bid Depository of San Diego County, a co-operative, non-profit organization designed to serve as a bid deposit and distribution center for the local construction industry, has been announced. Offices of the new organization are at 3907 El Cajon Blvd.

Function of the depository was outlined as: "A voluntary association of construction industry trade associations to protect the construction industry from sharp practices which increase costs, weaken quality, and destroy public confidence."

Any awarding authority, whether architect, owner, governmental organization, or general contractor, may certify the San Diego Bid Depository as the official trustee through which subcontractors, suppliers, or others shall submit bids on a specific project. Use of the depository is provided awarding authorities without charge, but once the depository has been appointed for a specific job, the awarding authority must award the contract to the low acceptable bidder in each category on which competitive bids have been requested. Categories of work covered include electrical, plastering, plumbing, painting, roofing, and the work of other subcontractors.

Bonded employees of the bid custodian receive sealed envelopes containing subcontractor bids, time-stamp the envelopes, and place them in locked boxes until the scheduled bid opening. Awarding authorities may reject bids from any bidder with whom he does not wish to work. This is done by marking the unopened bid envelope "rejected", signing it, and returning it to the bid custodian.

The system assures owners and awarding authorities the lowest practicable cost for each segment of a construction project.

The Bid Depository of San Diego was organized by the Construction Subcontractors Association of San Diego, a non-profit trade association. Functions of the depository and of the bid custodian are under supervision of the Board of Governors, composed of representatives from each subcontracting trade association, general contractors, architects, and engineers. Operations are financed by a percentage levy on the value of the bid of each successful bidder.

Working on antenna silos 27 ft. in diameter and 65 ft. deep, the MC-760 makes big lifts with precision control. Its rugged carrier with a 230" wheelbase is built by Lorain to withstand the torsional stress of heavy-duty service. "Shear-Ball" Connection keeps swings smooth, reduces maintenance, and is warranted for 10 years.

At nation's first totally underground missile base Lorain Moto-Cranes speed construction

With its Power-Set® Outriggers set for sure stability, this 65-ton Lorain Moto-Crane MC-760 positions 42-ton antenna silo terminal junctions at Lowry Air Force Base near Denver. This is one of two of this model at work here. Morrison-Knudsen Company, Inc. and Associates use the capacity and mobility of Lorain Moto-Cranes in constructing six missile complexes of their $67.5 million contract.

The MC-760 loses no time as it moves between jobs at each extensive complex. Power-Set Outriggers adjust to the roughest terrain in less than a minute. Move-ups take even less time. This Moto-Crane travels 5 to 37 miles between complexes at 37 mph. At the job the "760" has the balance, control and capacity to keep output high.

Today's pace setting jobs call for reliable Moto-Crane performance. Lorain dependability is backed by over 40 years' experience in building rubber tire cranes. Progressive contractors know that Moto-Cranes get to the job faster, finish the job quicker.

For details, see your Lorain distributor.

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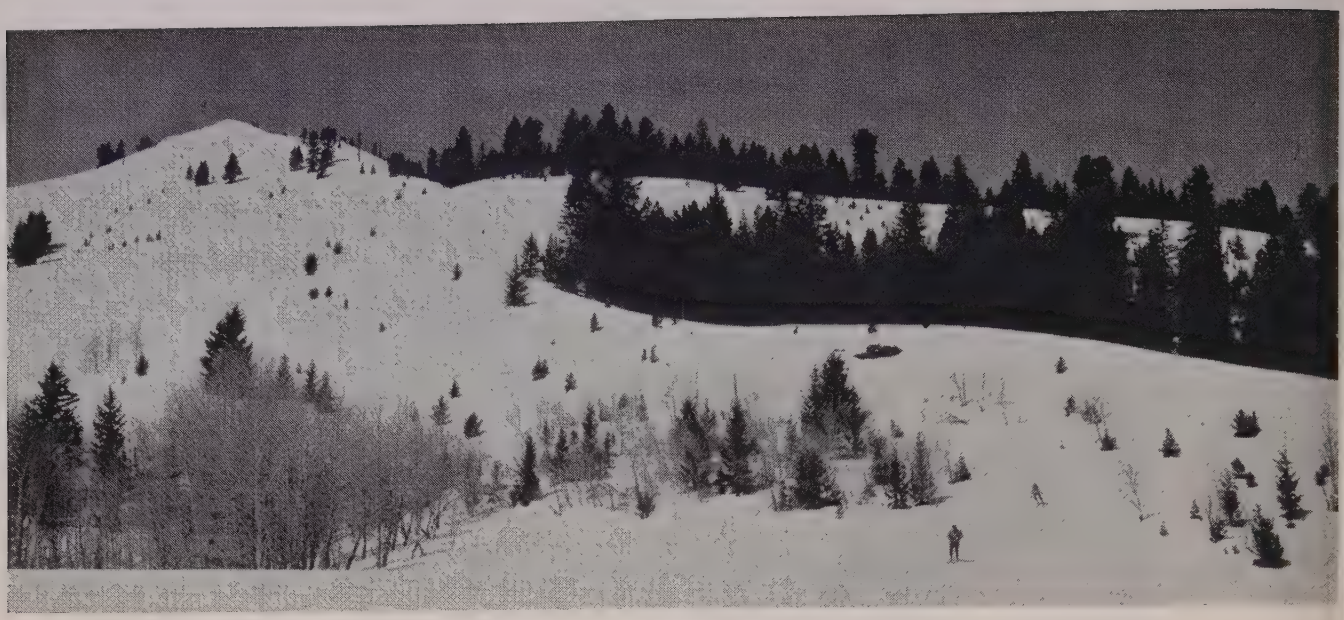

Over-all prospects are not good for the—

1960 water supply for the West

HOMER J. STOCKWELL
Water Supply Forecast Section
Soil Conservation Service
Portland, Oregon

and

J. ALDEN WILSON
Assistant Snow Survey Supervisor
Soil Conservation Service
Boise, Idaho

THE WATER SUPPLY outlook for the southwestern states of Arizona and New Mexico is the best it has been for several years. The streamflow and water supply outlook on the Missouri and Columbia rivers and Great Basin is below normal. Prospects are that the extremely low runoff of 1959 in California's Central Valley will be repeated this year. Streamflow forecasts for some streams of the West are as low as half of normal.

The water supply will be adequate along the major rivers, or shortages will be alleviated because of carryover storage or because the supplies normally exceed the demands. The shortage can be serious along the smaller tributary streams where reservoir storage is limited and demands equal or exceed normal supplies.

Reservoir storage resulting from the high runoff years of 1957 and 1958 was reduced considerably during 1959. The carryover is adequate in some areas, but in others lack of storage will have an adverse effect on supply. More reservoirs are needed on the smaller streams where the late season flows normally are exceeded by irrigation needs.

Because snowpacks in the mountains are generally below average, there will be reduced danger from high streamflow resulting from snowmelt. Even in areas of above normal snowpacks, the streamflow is expected to be controlled.

Forecasts of 1960 irrigation water supply and general water supply conditions in the West are based upon April 1 measurements made by the U. S. Department of Agriculture Soil Conservation Service and many cooperating organizations* on more than 1,400 snow courses, and 100 soil moisture stations. Basic climatological data obtained by the U. S. Weather Bureau, and streamflow data provided by the U. S. Geological Survey are part of many forecast procedures. Plans by the management of water-using organizations also are a definite factor in water supply outlook. Data on the amount of water stored in about 250 reservoirs have a bearing on the total amount of water to be available. Relative demand in relation to the supply also is considered.

Supply forecasts are made to assist all users in making plans for the most efficient use of water they control. With a widespread shortage in prospect this year, agricultural water users in particular are being urged to closely check on water conditions in their area. Financial loss because of lack of water during the irrigation season can be reduced by proper planning.

Water conditions on some of the major streams in the West are reviewed briefly:

The surface water supply outlook in Arizona is relatively good. There is above normal storage in major reservoirs on the Gila and Salt rivers. Streamflow during 1960 has been above normal, and is expected to continue so through April and May. Demands for groundwater sources will be reduced temporarily by the surface supply. Summer runoff along the Rio Grande in New Mexico is expected to be slightly above the long-term normal, and considerably in excess of the average for the last 15 relatively dry years. Water supplies are expected to be reasonably adequate on the Rio Grande and on the Carlsbad and Tucumcari irrigation projects on the eastern plains of New Mexico.

Colorado's snowpack is normal or better. Water supplies in most areas are average to good. Lack of reservoir storage may result in shortages on the lower Arkansas River. Above normal summer flows are expected on the Rio Grande, San Juan, and Dolores rivers. Storage and diversion from the Colorado Basin, along with prospective

(Continued on page 109)

SNOW SURVEYS

(Continued from page 104)

streamflow, will provide average or better water supplies on the South Platte tributaries.

The water supply in Wyoming is below average. Inflow to the major reservoirs on the North Platte is forecast at 63% of normal. Because of available storage, water supply demands will almost be met on the North Platte main stem in Wyoming and Nebraska.

In Montana, the flow of upper Missouri tributaries is forecast at about 80% of normal. Shortages on some small streams can be expected in late July and August. Forecasts range about three-fourths of normal on Columbia River tributaries west of the Continental Divide.

Unregulated streamflow will be extremely deficient along the Snake River and its tributaries in the Idaho section of the Columbia Basin. Seasonal streamflow for the main stem will be near 60% of normal. Shortages, however, are not expected for the Snake River main stem and the Boise River because of carryover storage.

Streamflow of 50 to 80% of normal is expected on Columbia River tributaries in Washington. Irrigation reservoir storage, especially on the Yakima, is above normal. Shortages are expected only where limited or no storage is available.

Late season shortages will be general for Oregon's irrigated areas. Snowmelt season runoff varies between 60 and 85% with a low of 47% on the Silvies River. Statewide carryover reservoir storage is near normal. Streamflow about half normal is forecast for the east slope of the Sierra in Nevada.

There will be a serious shortage of water in California during the coming season. Runoff from most of the snowmelt streams from April to July will range from 50 to 60% of average, slightly more than in 1959. The two consecutive dry years make the 1960 shortage more serious and will result in the lowering of groundwater tables in many areas.

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* The Soil Conservation Service coordinates snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Forest Service, Geological Survey, other Federal Bureaus, various departments of the several states, irrigation districts, power companies, and others. The California State Department of Water Resources, which conducts snow surveys in that state, contributed for California figures appearing in this article. The Water Rights Branch, British Columbia Department of Lands and Forests has charge of the snow surveys in that province and likewise contributed the information here for British Columbia.

Western Runoff Forecasts for 1960

	Runoff 1,000 ac. ft.	April-Sept., inc. percent of normal
RIO GRANDE		
Rio Grande nr. Del Norte, Colo	680	153
Conejos nr. Mogote, Colo.	250	127
Inflow to El Vado Reservoir	275	138
Rio Grande at Otowi Bridge, N. Mex.	1,008	158
Pecos River at Pecos, N. Mex.	70	146
PLATTE RIVER BASIN		
Poudre at Canon, Colo.	195	103
Clear Creek at Golden, Colo.	151	110
No. Platte at Saratoga, Wyo.	416	63
ARKANSAS RIVER BASIN		
Arkansas at Pueblo, Colo.	360	105
MISSOURI RIVER BASIN		
Yellowstone at Corwin Springs, Mont.	1,312	66
Wind River at Dubois, Wyo.	77	70
Madison nr. West Yellowstone, Mont.	153	71
Jefferson at Sappington, Mont.	977	91
Missouri at Fort Benton, Mont.	2,955	82
Clark Fork at Chance, Mont.	430	70
COLUMBIA BASIN		
Columbia at Birchbank, B. C.	41,200	97
Clark Fork nr. Plains, Mont.	9,478	77
Clark Fork at Cabinet Gorge, Mont.	10,676	77
Pend Oreille blw. Box Canyon, Wash.	13,000	79
Flathead nr. Polson, Mont.	6,089	82
So. Fork Flathead nr. Columbia Falls, Mont.	1,819	79
Snake nr. Heise, Idaho	2,800	68
Columbia at The Dalles, Ore.	95,600	90
Umatilla at Pendleton, Ore.	165	88
Powder nr. Baker, Ore.	53	80
Owyhee Res., net inflow, Ore.	275	64
Deschutes at Benham Falls, Ore.	540	90
McKenzie nr. Vida, Ore.	1,020	75
Willamette at Salem, Ore.	4,995	78
COLORADO BASIN		
Salt at Intake, Ariz.	155	124**
Gila at Virden, Ariz.	17	124**
Green at Linwood, Utah	840	61
Colorado at Glenwood Springs, Colo.	1,650	107
San Juan at Rosa, N. Mex.	760	129
Animas at Durango, Colo.	570	120
Dolores at Dolores, Colo.	335	120
Colorado at Grand Canyon	8,860	97
Duchesne nr. Tabiona, Utah	95	77
Gunnison at Grand Junction, Colo.	1,390	101
GREAT BASIN		
E. Walker nr. Bridgeport, Calif.	25	41*
W. Walker nr. Coleville, Calif.	86	58*
Carson nr. Carson City, Nev.	95	52
Humboldt at Palisade, Nev.	45	20
Bear at Harer, Idaho	180	60
Weber nr. Oakley, Utah	111	83
Provo at Vivian Park, Utah	120	75
OREGON AND CALIFORNIA COASTAL		
Upper Klamath Lake, net inflow, Ore.	495	78
Rogue abv. Prospect, Ore.	300	85
No. Umpqua blw. Lake Creek, Ore.	144	77
Sacramento (Shasta Res. inflow), Calif.	1,580	80*
Feather nr. Oroville, Calif.	1,270	62*
Yuba nr. Smartville, Calif.	750	65*
American at Fair Oaks, Calif.	880	61*
Mokelumne nr. Mokelumne Hill, Calif.	290	58*
Stanislaus blw. Melones Power House, Calif.	410	53*
Tuolumne abv. La Grange Dam, Calif.	750	59*
Merced at Exchequer, Calif.	360	55*
San Joaquin blw. Friant, Calif.	670	53*
Kings River (Pine Flat Res. inflow), Calif.	560	45*
Kaweah River nr. Three Rivers, Calif.	125	45*
Tule River nr. Porterville, Calif.	12	24*
Kern River nr. Bakersfield, Calif.	175	37*

* April-July
** April-May

WESTERN CONSTRUCTION NEWS ®

Colorado River hearing is set

THE Federal Power Commission has scheduled consolidated hearings to commence next September in Washington, D. C., on conflicting applications by the City of Los Angeles, Calif., and the Arizona Power Authority, of Phoenix, Ariz., proposing the construction of hydroelectric projects in the same stretch of the Colorado River Basin.

The Arizona Power Authority is proposing a $347,300,000 project with a total initial capacity of 820,000 kw. with possible future installation of an additional 650,000 kw. The project would consist of three developments — Bridge Canyon, Marble Canyon, and Little Colorado River. The Little Colorado development would consist of the Tolchico and Moenkopi reservoirs for purpose of silt detention.

The City of Los Angeles and its Department of Water and Power propose to build a hydroelectric development with 1,000,000 kw. of installed capacity, at the Bridge Canyon site, and a silt detention dam (Coconino) on the Little Colorado River, with a switchyard and transmission lines in Clark County, Nevada. Estimated cost of the project is $243,083,000.

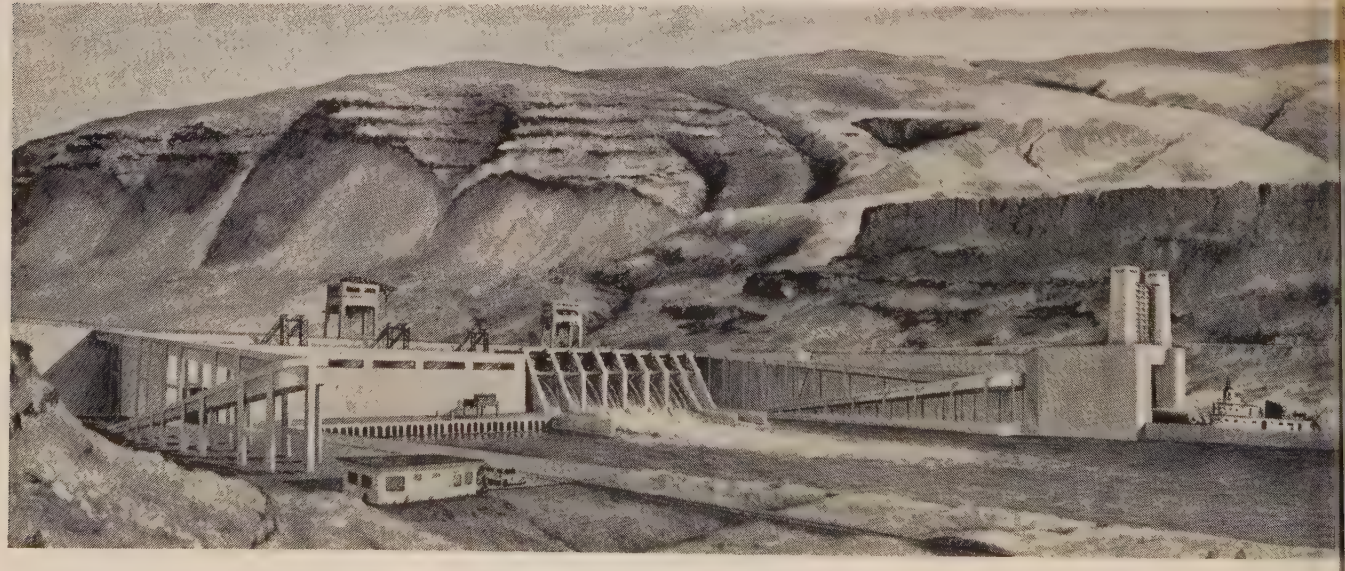
The Arizona Power Authority would distribute power from its proposed project throughout Arizona or through sale or exchange with other power distributors in adjacent states over an interconnected transmission system. Power generated at the proposed City of Los Angeles project would be used in Los Angeles.

In its order scheduling the consolidated hearing, the Commission prescribed procedures which it said were designed to result in "obtaining an orderly record, the saving of hearing time, and the associate costs and conveniences involved. The procedures, which require tha the respective parties be prepare in advance of the hearing for pre entation of their direct cases, ar intended "to eliminate any caus which might otherwise exist for protracted hearing," the FPC sai

Dean Eckel retires from the Univ. of Colorado

A LEADING engineering educato of the West — Clarence L. Eckel will retire June 30 after 46 year of service, nearly all at the Unive sity of Colorado. Eckel, who is 68 has been a member of the unive sity's faculty since 1914. He cu rently is professor of civil eng neering and dean of the Colleg of Engineering.

Eckel went into teaching as a instructor in civil engineering in



A PREVIEW OF LOWER MONUMENT DAM ON THE SNAKE RIVER

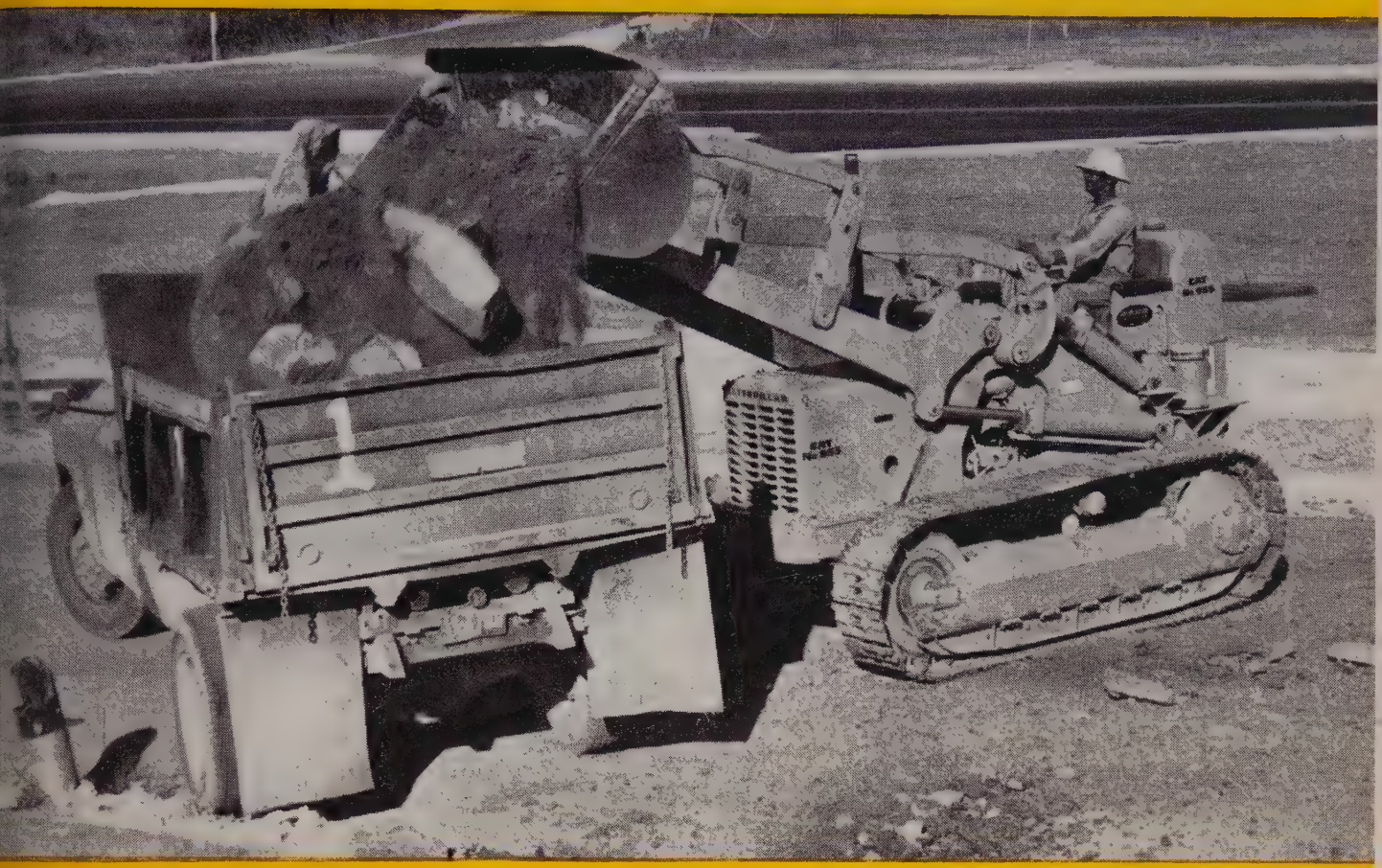
ARTIST'S conception of Lower Monumental Lock and Dam on the Snake River as designed by the U. S. Army Engineer District, Walla Walla, Corps of Engineers. Lower Monumental Dam will be the second in the series on the Lower Snake River.

Planning studies for this project were inaugurated by the Walla Walla District from an appropriation of $1,050,000 in funds made during fiscal years 1958 and 1959. These funds were requested to determine the recommended plan of improvement, site location and pool elevation.

Tentative location of the dam is 42 mi. upstream from th confluence of the Snake and Columbia rivers. Reservoir wi extend slack-water navigation another 33 mi. upstream fro the headwaters of the pool at Ice Harbor.

The dam, as planned, will have an effective height of 93 f and an initial installation of three main units of 90,000 kw each. Three skeleton power unit bays will be included to pr vide an ultimate installation of three more units. Investmen for the initial construction of Lower Monumental Lock an Dam is set at $138,000,000.

CAT No. 955 TRAXCAVATOR



"Gets the work done wherever you put it!"

—G. K. JONES, CONTRACTOR, WACO, TEXAS

That's how Mr. Jones, who has used Caterpillar-built equipment for years, sums up the performance of his No. 955 Traxcavator. Here you see it loading old broken concrete on a subcontracting job on U. S. 81. Loading pit run gravel on another section of the job, it handled 1000 yards a day in difficult digging. "The No. 955 sure can take it," Mr. Jones said. "It's tough and durable."

Now an even stronger No. 955

As rugged as this No. 955 is, the most recent model is even more rugged. It has been strengthened from lift arms to tracks to deliver an even longer life of profitable performance. Consider the undercarriage, for instance. It now features lifetime lubricated rollers and idlers that need no lubrication service until rebuilding. This completely eliminates on-the-job lubrication of these parts. Another plus: Hydraulic track adjusters are now standard on the No. 955. An ordinary grease gun is all that's needed to adjust tracks. Along with these and other improvements the No. 955 retains such time-tested features as the exclusive oil clutch which provides up to 2000 hours without adjustment.

Top production from 3 Traxcavators

Whatever your job, there's a Traxcavator to fit its requirements: The 955E—70 HP, 1½ cu. yd. bucket; the 933F—52 HP, 1⅛ cu. yd. bucket; the 977E—100 HP, 2¼ cu. yd. bucket. There's also a complete line of quick-change attachments to increase its usefulness on your job—special buckets, bulldozers, forks, the rear-mounted ripper and the exclusive side dump bucket. Let your Caterpillar Dealer help you select the Traxcavator that will pay off best for you. Want a demonstration? Just name the place and date!

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CATERPILLAR

BOOST PRODUCTION AND LOWER COSTS WITH A VERSATILE TRAXCAVATOR

mediately after receiving his bachelor of science degree from the University of Colorado in 1914. He was promoted to assistant professor in 1919, full professor in 1923, head of the department in 1926 and dean of the college in 1943.

In his only full-time teaching position away from the Colorado campus, he served as an assistant professor at the University of Pennsylvania in 1919-1923, during which period he received the civil engineer degree from the University of Colorado.

Eckel also has worked as a consulting engineer during most of his teaching career.

Oil pipe-line project on Alaska's Kanai Peninsula

PLANS for construction of a 20-mi. common carrier crude oil pipe line and marine terminal facilities on Alaska's Kenai Peninsula have been announced by Standard Oil Company of California, Western Operations, Inc. Total cost will be more than $4,000,000 and completion is scheduled by mid-1961.

The project will include an 8-in. line to a new marine terminal at Nikiski on the Cook Inlet 20 mi. west of the producing area. It will be owned by the Kenai Pipe Line Company, a newly-formed operating affiliate.

Construction of storage facilities at Nikiski will start shortly. Work on the line itself will start as soon as right-of-way arrangements are concluded. Completion of the line will eliminate present limited trucking of crude oil to Seward on the southeast coast of the peninsula.

Principal engineering problem in the project will be construction of the marine terminal on the Cook Inlet. Excessive tidal action there produces tidewater velocities of up to 7 knots and water level variations of 25 ft. The terminal itself will consist of a 1,000-ft. causeway leading out to a dock at minimum water depth of 40 ft. It will be designed to accommodate tankers of up to 28,000 deadweight tons.

Modern air terminal at Las Vegas

DRAMATIC design for new airline terminal facilities at Las Vegas, Nev., has been announced by Harley Harmon, chairman of the Clark County Board of Commissioners. Construction of the jet-age facility, which will help make Las Vegas a major port of call for air travelers in the 1960's will begin this fall, following recent approval by Clark County voters of a $5,000,000 bond issue.

"The need for modern airport facilities in Clark County is graphically shown when one considers that the airport accommodated 12 flights daily with a total of 35,106 passengers in 1948 and 99 flights daily with a total of 959,603 passengers in 1959," Commissioner Harmon stated.

Facilities will include two primary two-story buildings, one for ticketing, baggage and airline offices and the other a passenger waiting terminal and restaurant; passenger loading fingers with 16 gate positions which can accommodate the largest jet airliners; a control tower; a fire station; and parking for 1,400 automobiles.

As envisioned by Welton Becket and Associates, architects and engineers for the $4,500,000 project, the terminal complex will represent a fresh approach, with maximum operating efficiency.

The two-level hexagonal passenger waiting building with its thin-shell concrete roof will be the focal point of both design and function. The top level of the structure will be glass enclosed, affording a commanding view of the airport and surrounding valley landscape. From the outside, the building will have a completely open appearance, an effect which will be enhanced by the use of low interior partitions throughout.

The ground floor of the 38,850-sq. ft. structure will house mechanical equipment including the air conditioning system for the entire new terminal, a kitchen for the restaurant, a staff cafeteria, and storage areas.

Hydro project planned on California's Yuba River

THE FEDERAL POWER Commission has issued a 24-month preliminary permit to Nevada Irrigation District of Grass Valley, Calif. for a proposed hydroelectric project in Sierra, Nevada and Placer counties. The proposed project would be located on the South Fork of North Yuba River, Middle Yuba River, South Fork of Middle Yuba River, Canyon Creek, South Yuba River and Bear River. The development features two powerhouses having a combined installed capacity of 55,000 kw., five reservoirs totaling 92,000 ac-ft. of storage, canals, and related facilities.

The preliminary permit does not authorize any construction. It gives the holder the right to priority for an FPC license while making detailed studies of the economic feasibility of the project.

Washed sand and gravel . . . 250 tons per hour profitably produced by

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Copper State Tractor Company
Phoenix, Arizona

J. D. Coggins Company
Albuquerque, New Mexico

The Carrington Company (Alaska)
Seattle, Washington

Diamond Iron Works engineers have helped a new sand and gravel operator design a plant to profitably produce 250 tons of crushed and washed aggregate per hour.

The firm is Parmar Sand, Inc. of Transfer, Pa.

Their Diamond closed circuit plant takes a wide variation of sand and gravel, obtained from two different pits, and turns it into seven basic grades, including both concrete and mason sand.

Parmar's market is broadened further because the close control possible with their Diamond plant assures materials which meet specifications for both highway and commercial construction in two states.

Another advantage of the plant, in addition to being compact and electrically driven, with all wiring underground, is that it requires very little supervision. And it is designed so that future expansion will require minimum alteration to existing facilities.

In summary, this is another example of how Diamond provided a profit package of high capacity, smooth operation, and low cost. We'd welcome the chance to help you—regardless of the size plant you want. See your Diamond Distributor.

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ALASKA Newsletter

By CLIFFORD S. CERNICK, Fairbanks

BLIZZARD—AND BOOM—As I write this, a blizzard is howling across Fairbanks, piling up snow in drifts and putting a cold hand on hopes for an early start to the construction season. Even so, the construction season here in the Interior of Alaska has started at last. Records of the State Employment Office here early in April showed that there were more job openings in the past week than there had been in the entire two previous months. The Employment Service has informed me that the call has gone out for carpenters, plumbers, steamfitters, electricians and heavy equipment operators. Stewart Bowdin, the new manager of the employment office, said the start of "heavy" hiring for construction jobs is being held up by poor weather. He predicted a very busy summer of general work activity—and high employment. Unions here also report that heavy hiring should start soon.

FROST HEAVING—An interesting report on frost heaving and its effect on structural piles has been issued by the Geological Survey. The report cites several examples near Fairbanks.. When ground is forced upward by freezing action, engineering structures may also be forced upward. The Geological Survey report points out that piles may be moved upward if the upward force of the frost heaving of ground—which is frozen to the piles—is greater than the downward force of the weight of the pile, its load and friction between the pile and the ground below the seasonal frost. Piling of many woodpile bridges of the Alaska Railroad in the Goldstream Valley near Fairbanks are frost heaved each year, requiring expensive maintenance. Contractors who have—or plan to have—jobs in Alaska, particularly road and bridge work, would do well to get a copy of this report from the Department of the Interior.

HUGE CONSTRUCTION CARGO—The first shipment of bulk cement for Alaska's 1960 construction season has reached Alaska. It consisted of 17,000 barrels shipped north from Bellingham, Wash., in a flat-bottomed steel barge. Bulk cement, which can be handled more efficiently and at less cost than sacked cement, has been a real boon to Alaska contractors. At Anchorage, storage is available for 36,500 barrels of cement. The Anchorage plant supplies cement for the Fairbanks area, which in turn forwards it to "bush jobs" in the Interior. No bottleneck in this important commodity is anticipated since production and transportation problems have been worked out so successfully by the cement suppliers.

* * *

HANDS ACROSS THE BORDER!—One of the biggest construction jobs in the North during World War II days—a joint Canada-U. S. enterprise—was turned over to Canada on March 31 by the U. S. Army. It is the Canol pipeline system and storage facilities which were built in the Yukon Territory of Canada.

during the war to supply fuel to allied military operations in the Pacific area. The lines are surface-laid and were constructed under the joint direction of the U. S. Army Corps of Engineers and Canada's Public Roads Administration. The transfer ceremony was held in the office of Yukon Territory Commissioner F. H. Collins at Whitehorse, who represented Canada during the ceremony. Traveling from U. S. Army, Alaska headquarters at Fort Richardson, near Anchorage, to be present at the ceremony were Col. J. B. Baker, Army Alaska Quartermaster and Col. W. C. Gribble, Jr., Alaska Army District Engineer. They acted in behalf of the Department of the Army. The facilities were inspected and approved by a joint American-Canadian team of experts and a price agreed upon between the two governments. The purchase price was paid in Washington, D. C.; transfer documents were exchanged at Whitehorse and the Canol Pipeline System became Canadian property.

FERRY SERVICE—Motorists traveling between Fairbanks and Nenana will have ferry service this summer for the first time since the road was built. The Tanana River crossing will be supplied by the state. Ultimately, a bridge is planned for the crossing.

AIRFIELD BUILDING—Contrary to what many construction men think, building an airfield in Alaska is easier in many respects than it is in the "South 48." Bill Walker, who is a soils engineer for the U. S. Army Engineer District, Alaska, gives one of the reasons on the basis of his experience on military airfields both north and south. Walker points out that in Alaska airfield construction is facilitated because much of the terrain is underlain with gravel beds which have good bearing characteristics.

JOB AT NOME—Early this month, a "Cat train" is scheduled to leave Nome with equipment to set up camp for the E and B Construction Company's road job 70 mi. north of Nome. E and B's bid was $16,000 below that of the next-lowest bidder. Axel Edman, one of the officials of the firm, said he will hire about 30 men for the

job. Equipment purchased for the far-north road job includes three dump trucks, a four-wheel-drive pickup truck and major dragline parts. The equipment will be shipped north on the first boat of the season to reach Nome—which usually arrives there around mid-June.

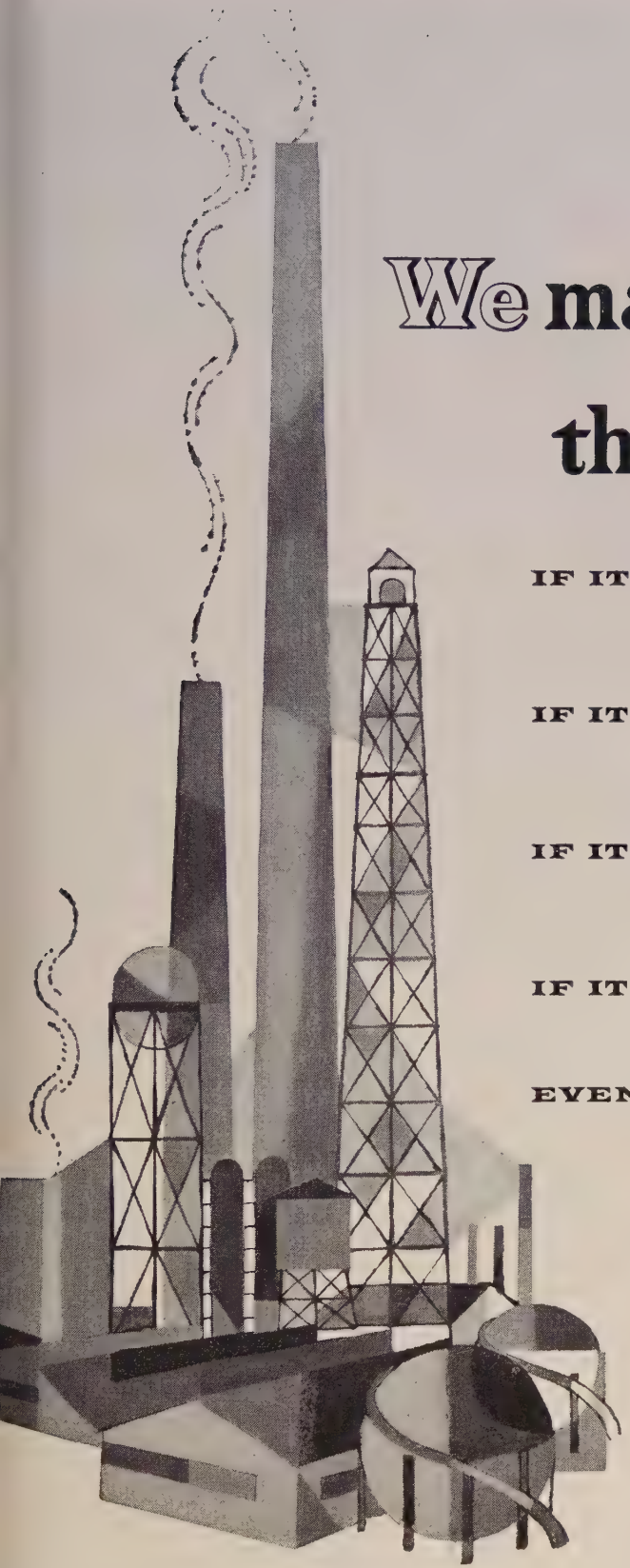
SNOWSLED TRAVEL—Contractors having jobs in remote areas of Alaska during the winter months should look into a unique new motorized sled which recently was tested in the Interior. A party of four people, including a woman, successfully completed a trip from Bethel to Fairbanks on the sleds in about three weeks. The tracked vehicles, manufactured by a Minnesota firm, can operate on ice only three inches thick and can travel equally well on snow, bare ground or ice.

WORK ON PORT—Construction has resumed on the City of Anchorage's $8,000,000 port facility. It is expected that the port will be in service by Nov. 2 of this year. Bert van der Meer is resident engineer for the designers and supervisors of the port—Tippetts-Abbett-McCarthy-Stratton, engineers and architects. About 150 men will be employed at the peak of port construction, van der Meer stated.

HOSPITAL BIDS—Ground breaking for a new $6,000,000 hospital in Anchorage is expected to take place around May 15. The hospital is being built by the Sisters of Providence Hospital. Charles Luckman and Associates of Los Angeles are the designers of the structure, which will replace the present smaller hospital in the downtown area of Anchorage. A fund drive is currently in progress to raise the balance of $750,000 needed to complete financing on the project.

NEW BASIC INDUSTRY—A new firm will begin making bricks and construction tile out of Alaskan clay before the end of this construction season. Frank E. Greenleaf, president of the Atlas Brick and Tile Co., said construction on the plant will start immediately. The company already holds clay leases and has completed an agreement with the State Division of Lands to buy 50,000 yd. of clay located along the tideflats near Anchorage. Greenleaf estimated his firm's investment in the enterprise would total about a quarter of a million dollars. The plant will have a capacity of between 80,000 and 100,000 bricks a day—enough for several houses.

CONSTRUCTION NEWS NUGGETS—The building trades—and others—have been so brisk in Anchorage that a fourth bank is being established there . . . Plans for a new post office building in the downtown urban renewal area are being considered. The building would be put up by private investors and leased to the government . . . More than 70 additional workers have been dispatched to the Clear construction project and another 100 should go out within the next three weeks . . . Work will be resumed in May on the Cushman Street bridge in downtown Fairbanks—one of the many projects held up by last year's labor dispute.



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The Fairbanks, Morse line of pumps includes a type, size and capacity for almost any pumping requirement—and the power unit matched to drive it!

Pump sizes to 152 inches . . . capacities to 800,000 gpm . . . heads to 3000 psi.

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Fairbanks, Morse

PUMP AND HYDRAULIC DIVISION • KANSAS CITY, KANSAS

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Power contract permit work on hydro project starts

THE Oroville-Wyandotte Irriga tion District and the Pacific Gas and Electric Co. have signed a fifty-year contract which will make possible the construction of a $62,000,000 South Fork Feather River water and power project. OWID President D. D. Updegraff and S. L. Sibley, vice president and general manager of PG&E, signed the agreement in Oroville March 29. Under terms of the contract PG&E will pay the District $3,158,000 a year for electricity to be generated in three South Fork Project power houses, enough money to cover all costs of building and operating the new water and power system, Updegraff said.

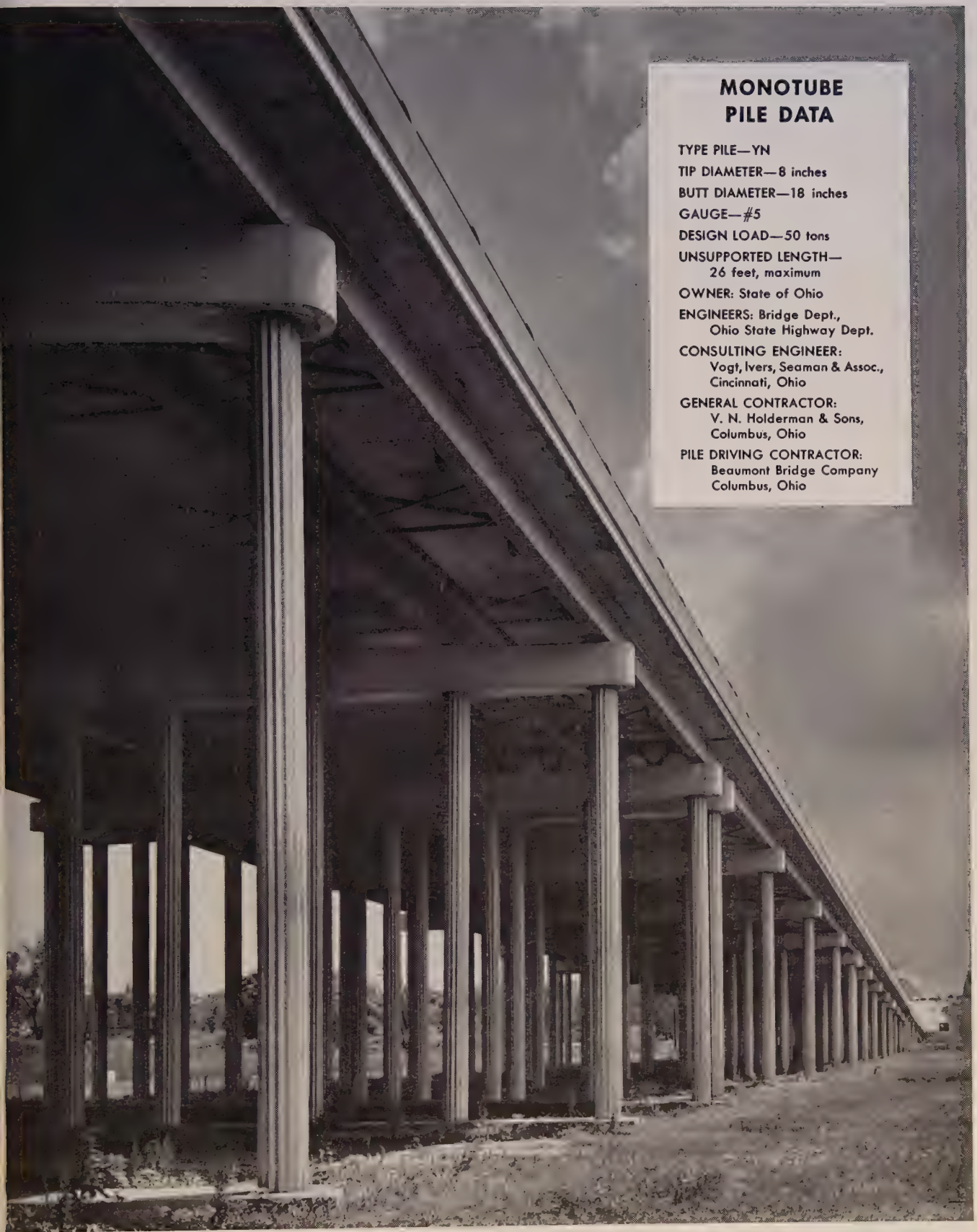
"This contract with PG&E for purchase of the electric power generated in our power plants will provide the revenue to finance our project. Without this cooperative arrangement the project couldn't be constructed," the OWID president said.

"Locally financed projects like this one are essential to development of the state's water resources in accordance with the State Water Plan. They can be built without diverting any money from necessary large state undertakings like the Feather River Project, and without burden to the district's taxpayers," Updegraff explained.

The project will impound 163,000 ac. ft. of water on the South Fork of the Feather River and its tributaries. Two new storage dams and four afterbay and diversion dams will be built. The three powerhouses will have a total electric generating capacity of 86,500 kw. Also included are 17 mi. of tunnel and 23 mi. of canal to transport water for irrigation and domestic purposes, as well as for power production.

Bank protection program on Sacramento River

A NEW 10-year program of bank protection work on the Sacramento River is to be recommended to Congress. Because the safety and integrity of existing levees are threatened, Lt. Gen. E. C. Itschener the Engineer Chief, has endorsed proposals from district and division offices for modification of the present flood control project to reduce future danger of inundating



MONOTUBE PILE DATA

TYPE PILE—YN

TIP DIAMETER—8 inches

BUTT DIAMETER—18 inches

GAUGE—#5

DESIGN LOAD—50 tons

UNSUPPORTED LENGTH—
26 feet, maximum

OWNER: State of Ohio

ENGINEERS: Bridge Dept.,
Ohio State Highway Dept.

CONSULTING ENGINEER:
Vogt, Ivers, Seaman & Assoc.,
Cincinnati, Ohio

GENERAL CONTRACTOR:
V. N. Holderman & Sons,
Columbus, Ohio

PILE DRIVING CONTRACTOR:
Beaumont Bridge Company
Columbus, Ohio

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with Monotube piles. When soil conditions in Mansfield, Ohio, prohibited conventional construction in crossing low-lying land, this adaptation of a foundation supported on Monotube steel piles proved to be an economical solution.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. The Union Metal Manufacturing Co., Canton 5, Ohio—Brampton, Ontario, Canada.

UNION METAL
Monotube Foundation Piles

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large areas such as happened in 1937, 1940, 1942 and 1955-6.

The proposed new work has been found desirable and necessary by the Board of Engineers for Rivers and Harbors, and would provide a bank erosion control and levee set-back program which is estimated to cost $21,360,000. Of this sum, the Federal Government would pay $14,240,000, with state and local agencies footing the rest of the bill.

While the district and division proposed only to protect banks by rock placement, the Engineer Board also suggested that some levee relocation may be desirable. The report acknowledged that set-backs can result in loss of land and unfavorable channel alignment and therefore cannot be carried out extensively. However, this procedure would result in some savings where practicable, it said, suggesting that when local interests prefer bank stabilization in areas where the Corps thinks relocation feasible the difference in cost should be paid by the local agencies involved.

Highway sign manual being modernized by committee

A general revision of the basic manual which for many years has provided the accepted national standards for highway signs, signals, and pavement markings is now under way, Federal Highway Administrator Bertram D. Tallamy has announced. The revised manual on Uniform Traffic Control Devices for Streets and Highways is expected to be completed this summer. The last edition of the manual was published in 1948 and limited changes were made in 1954.

The new revision is being prepared by the National Joint Committee on Uniform Traffic Control Devices, which also developed the previous editions. The committee, formerly composed of representatives of the American Association of State Highway Officials, the Institute of Traffic Engineers, and

TOUGH TERRAIN CALLS FOR HELICOPTER TO SET POWER POLES

This winter two modern aids were used by Line Builders, Inc., of Billings, Mont. The project covered the relocation of a Bureau of Reclamation powerline that climbed out of the Shoshone Canyon from Buffalo Bill Dam over Rattlesnake Mountain, west of Cody, Wyo.

The difficulties that faced Carl Noyes, vice president of Line Builders, included an urgent deadline. Noyes placed a call to Christler & Avery Aviation of Greybull, Wyo., a firm that had recently taken delivery of a 305-hy. Hiller 12E helicopter. The whole operation would take place at more than 5,000-ft. altitude, an impossibility for previous light helicopters. The 12E weighs only 1,700 lb. itself when empty, and the poles 1,100 lb.

The 12E helicopter not only placed every pole in footings where there was no room for near misses, but it also strung the lines, once the poles were set. It also had a good effect on the morale of the crews. As icy and steep as the canyons and cliffs were, the Hiller was overhead, ready to help in case of trouble.

the National Committee on Uniform Traffic Laws and Ordinances, now also includes representatives of the American Municipal Association and the National Association of County Officials. Included for the first time will be standards for modern expressways, including the Interstate System.

The Bureau of Public Roads, which is actively assisting the joint committee, has an important, direct interest in the manual. Federal legislation provides that any signs, signals, or markings installed on highways constructed with Federal-aid funds (since December 20, 1944) shall be subject to approval of the state highway department with the concurrence of the Secretary of Commerce, who is directed by the law to concur only in installations that promote safe, efficient highway use.

Inspection of Army jobs in the South Pacific Division

MAJOR GENERAL W. K. Wilson, Jr., Deputy Chief of Engineers for Construction, Corps of Engineers inspected the Army's major California construction propects during the ten day period from March 14 to 23. He was in San Francisco March 21 to 23 to attend and address the Associated General Contractors convention.

Among the construction projects inspected by the general were:

Construction of structures housing Missile Master and its required tactical facilities, a joint Army-Air Force facility of North American Air Defense Command.

Construction of missile base facilities at Vandenberg Air Force Base and Edwards Air Force Base. At Vandenberg, Army Engineers are building all required underground launching silos, tunnels, and support buildings for the prototype and operational Titan and Atlas missiles. (See *Western Construction,* April 1960). These include launch pads, tunnels, silos, propellant loading systems, and all support structures for Titan, Atlas, and Thor, as well as Bomarc, built under contracts totaling approximately $110,000,000 to date.

At Edwards Air Force Base, near Mojave, construction of the nation's newest missile test stand. This massive concrete and steel structure will accommodate the static testing of missiles, which are capable of generating up to 6,000,000-lb. thrust.

HAWAII Report

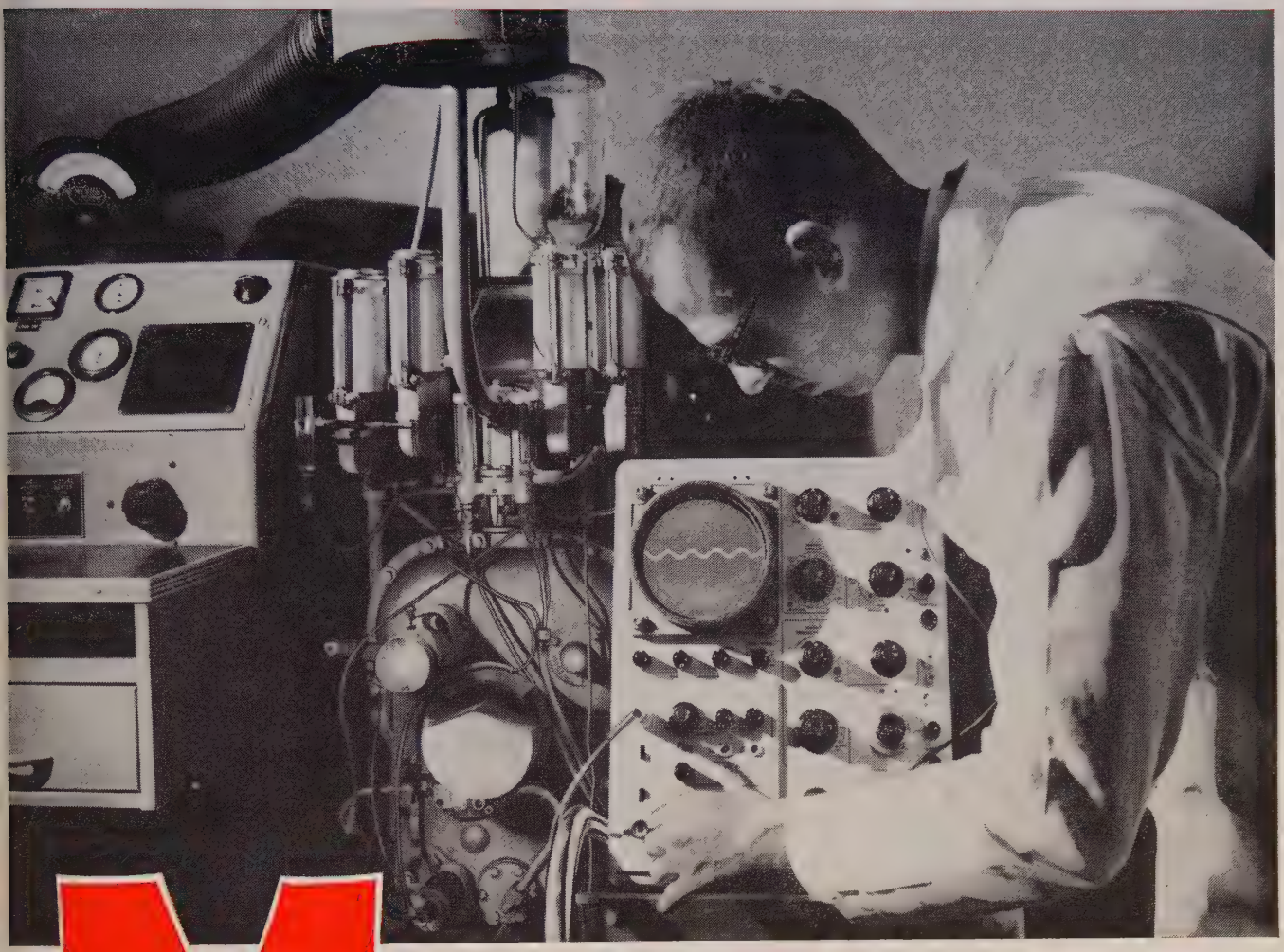
By ALAN GOODFADER, Honolulu

CO-OPS GO BIG — Honolulu's co-op craze, which has been altering the City's sky-line almost daily, seems to be gaining new strength. While the emphasis seems to have shifted from co-operative apartments to apartment-hotels, developers show no signs of moving to another field. Since my last writing, four co-op developments worth $11,500,000 were announced. The biggest of these was an $8,000,000 apartment-hotel development on which construction is slated to start in July on the Waikiki beach front. Developer is John Barkhorn and Associates. The plans call for a 22-story, 450-unit hotel, restaurant, cocktail lounge, swimming pool and shops. Waikiki also will be the site for a $500,000, 72-unit apartment-hotel to be built by William C. Vannatta. He's just finishing a 64-unit co-op apartment building in rural Oahu's Pokai Bay. The other two developments will be in the Ala Moana district next to Waikiki. One of these will be a $2,000,000, 12-story, 132-unit apartment-hotel featuring a roof-top swimming pool. The second will be a $1,000,000, 10-story hotel announced by George E. Freitas, president of Pacific Construction Co. Work on this one is to start about May 1.

ON A LOWER LEVEL — The U. S. Bureau of the Census has announced that the City and County of Honolulu (the island of Oahu) ranks 11th among U. S. city and county areas in the number of building permits issued for new houses. The 1959 total of 8,844, besides setting a local record, put Honolulu ahead of such cities as Philadelphia and Seattle.

SHIFT IN EMPHASIS—The predicted shift of construction activity, heretofore mostly concentrated on Oahu, to the Neighbor Islands may have started. The State Labor Department said new construction activity on Maui, Kauai and Hawaii boosted the construction labor force by more than 100 workers during February, although a slight decrease was recorded on Oahu. The shift may become a stampede soon if various straws in the wind prove accurate. For instance, Pioneer Mill Co. of Maui has announced the authorization of immediate construction of its long-awaited Kaanapali beach resort development. Blackfield Enterprises and Island Holidays, Ltd., are to build 60-room and 119-room hotels respectively, site improvements are to cost $1,500,000 and an 18-hole golf course is to be built. On the Island of Hawaii, the Pacific Resorts $300,000,000 development was to start construction of its first project, a private hunting club containing 20 cottages costing $25,000 each, shortly after this writing. Falzone Construction Co., a California firm which has established a branch here, announced through Builders Report Pacific that it plans a $3,000,000-plus hotel on Kauai.

Breakthrough in gasoline research!



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Methyl steps up octane performance so effectively that it stops power-wasting knock better than any other antiknock compound. Methyl means a power bonus and quieter performance for engines both old and new.

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MORE TO COME—Adding to the steam is a $49,000,000 comprehensive program for building up Hawaii's resort areas which Governor Quinn just handed to the Legislature. He recommended that the State start July 1 on a 10-year program that would spend $6,100,000 on 31 parks and historic sites, $26,800,000 on 30 highways and roads, $5,400,000 on eight water systems, $7,700,000 on 12 marinas, $1,100,000 on three golf courses and $1,900,000 on various other projects. The idea is that the public works would spur development of resort hotels to keep up with expected expansion of Hawaii's tourist business.

AND ON OAHU — That decline in employment we mentioned a bit back doesn't seem to be long in lasting. The Honolulu Building Department said it issued 1,019 building permits in February for construction worth an estimated $15,254,495. This compared with 679 permits issued in February 1959, for $6,336,154 worth of work and a total of 1,032 permits issued in January 1960, for a total of $7,735,520. Permits for the first two months of the year totaled 2,051 for work estimated at $22,990,015, compared to 1,418 permits for $14,217,167 during the same period of 1959.

IN THE WIND — The Skinner Corp. of Seattle has announced it plans to call for bids on a $400,000 bowling alley to be built in Kailua on Oahu's windward side. Bids were to be asked about the first of April, with work to be finished by Nov. 15. The City of Honolulu will build a revolutionary new type of school building using "clear-standing, column-free" aluminum structures that can be put to multi-purpose use. The work is an experiment in design it is hoped will save money for the City of Honolulu's frantic school construction program. International Business Machines, Inc., plans to occupy a five-to-seven-story, $800,000 to $1,000,000 building to be constructed by the local Victoria Ward, Ltd.

COST FACTOR — The Bank of Hawaii says wages of construction workers here rose sharply in the 12 months between February 1959, and February 1960. It said bricklayers went from $3.10 an hour to $3.45; carpenters, $2.85 to $3.10; electricians, $3.10 to $3.36, and construction laborers, $2.15 to $2.30.

Low bids and contract awards

ALASKA

Two contracts were awarded to **Manson-Osberg Construction Co.** of Seattle, Wash.: a $3,216,420 contract for construction of communications facility at Duncan Canal Air Force Station, the second, at $164,700, for communications facility at the Ketchikan ACS Station. **Gaasland Company, Inc.** of Bellingham, Wash., received the $1,105,389 contract for communications facility at Smugglers Cove Air Force Station. Work at the sites includes radio relay buildings, and other structures, grading and roadwork, plus other construction. **S. S. Mullen, Inc.,** Seattle, received a total contract of $3,008,147 for construction of communications facilities at Hoonah and Lena Point. Facilities at both sites will be composite building, radio relay buildings, and other construction. **Peter Kiewit Sons' Co.** of Seattle, submitted a low bid of $655,597 for construction of shops for Arctic Test Branch at Fort Greely.

ARIZONA

Bentson Contracting Co., Inc., Phoenix, received a $1,583,358 contract for 2.6 mi. of grading, surfacing and related work near Phoenix on State Route 69, Black Canyon Highway, in Maricopa County. **San Xavier Rock & Sand Co.,** Tucson, submitted a low bid of $136,940 for ¾ mi. of grading and surfacing, south of Tucson on the Ajo-Tucson highway in Pima County. **T.M.K. Construction Co.,** Phoenix, received a $134,421 contract for 2 mi. of grading, surfacing and draining in city of Phoenix.

CALIFORNIA

Griffith Co. of Los Angeles received an $8,737,889 contract for construction of 1.1 mi. of 8-lane freeway viaduct including portions of bridge to be constructed, ramps and frontage roads to be graded and surfaced in city and county of Los Angeles. A $4,109,789 contract was received by **Guy F. Atkinson Co.,** South San Francisco, for 2.1 mi. of grading, surfacing and 6 bridges and 19 retaining walls on U.S. 50 in city of Oakland. **Silva & Hill Construction Co.** and **Jack L. Adams Construction Co.** of South San Gabriel received a $3,-

768,522 contract for grading and paving to construct 8.5 mi. of 4-lane freeway on U.S. Highway 101, west of Santa Barbara. Work includes 12 bridges to be constructed, including interchanges, in Santa Barbara County. **Baldwin Contracting Co., Inc.** and **J. W. Briggs** of Marysville received a $1,188,123 contract for grading and surfacing to reconstruct and realign 5.1 mi. of U.S. Highway 299 east of Douglas City and the Shasta County line, to provide 2 lanes of a future 4-lane expressway. **McGuire & Hester** of Oakland received a $1,081,081 contract for construction of a 3-mile-long water transmission main in north Richmond. The main construction is tied in with plans for the new El Sobrante Filter Plant not yet built. **Madonna Construction Co.** of San Luis Obispo submitted two low bids for roadwork in Inyo and San Luis Obispo counties: a low of $624,585 for grading and surfacing to construct 18.5 mi. of 2-lane highway on State Highway 212, west of the Nevada line in Inyo County, and $339,324 for reconstruction and realignment on 3.1 mi. of State Sign Route 178, west of Simmler in San Luis Obispo County. **Osborn Co.** of Pasadena submitted a low bid of $454,808 for grading, surfacing and related work on 10 mi. of highway in Inyo County. A $447,829 contract was received by **Fredrickson Bros.** of Emeryville for construction of an interchange on U.S. 50, east of Sacramento, including a bridge. **Claude C. Wood Co.**, Lodi, submitted a low bid of $340,568 for 4.6 mi. of grading, realignment and related work on State Sign Route 88 north of Clements and the Amador County line in San Joaquin County.

COLORADO

Colorado Constructors, Inc. of Denver submitted a low bid of $1,744,186 for grading, surfacing and structures and twin tunnels on 2 mi. of highway, east of Idaho Springs in Clear Creek County. A low bid of $798,661 was submitted by **Shore Bailey Construction Co.**, Littleton, for 5 mi. of grading, structures and asphalt paving east and west of Lindon in Washington County. A low bid of $549,160 was submitted by **Smith & Lucas** of Colorado Springs for 9.9 mi. of grading, surfacing, structures and stabilization, Cedaredge, Delta County. **C. L. Hubner Co.** of Denver received a $481,750 contract for 7.3 mi .of grading, structures and asphalt surfacing on State Highway 2, west of Craig-west in Moffat County. **Pioneer Construction Co.**, Pueblo, submitted a low bid of $313,764 for 8.3 mi. of grading, surfacing and structures, east of Akron in Washington County. A $295,107 contract was received by **J. P. Elliott Co.**, Pueblo, for 2.8 mi. of grading, surfacing, stabilizing and structures on the Black Canyon Road-east to foot of Cerro Summit, State Highway 6, Montrose County. **Peter Kiewit Sons' Co.**, Denver, submitted a low bid of $293,981 for grading, structures and asphalt surfacing on 2.1 mi. of State Highway 95 in Denver and Jefferson counties. By **Domenic Leone Construction Co., Inc.** of Trinidad, for grading, surfacing and structures on 1.9 mi. of U.S. 24 between Peyton and Calhan in El Paso County. By **Siegrist Construction Co.**, Denver, for 2.2 mi. of structures, grading and surfacing east and west of Dacona in Weld County. **Hunt Construction Co.**, Steamboat Springs, received a $151,520 contract for 2.3 mi. of grading, surfacing and I-beam bridge across Currant Creek, north of Parkdale in Fremont County.

IDAHO

Duffy Reed Construction Co. of Twin Falls received a $195,700 contract for structures, grading and surfacing in Lincoln County. A $963,088 contract was received by **Technical Constructors** of Dallas, Texas, for construction of Spert IV, National Reactor Testing Station. **Pickett & Nelson** of Idaho Falls submitted a low bid of $178,038 for grading, surfacing and structures on 4 mi. of State Highway 49 north, in Bonneville and Jefferson counties. **James Reid** of Salt Lake City, Utah, submitted a low bid of $169,627 for construction of roadway, drainage structures and surfacing on 4.7 mi. of the Riverdale-Mink Creek road in Franklin County.

MONTANA

A $278,057 contract was received by **Mountain States Construction Co.**, Missoula, for 7 mi. of grading, surfacing and drainage on the Dutton-east road in Teton County. **Richardson Construction Co.** of Miles City, received a $254,048 contract for grading, surfacing and related work on 13.1 mi. of the Gallatin Gateway - South - Bozeman road in Gallatin County. **Stanley H. Arkwright** of Billings received a contract of $165,321 for 1.2 mi. of grading and surfacing on the Garrison-Helena road in Powell County. A $156,405 contract was received by **R. J. Sundling**, Livingston, for 9.9 mi. of grading and surfacing on the Glendive-Richey road in Dawson County.

NEVADA

Isbell Construction Co., Reno, received a $1,262,698 contract for construction of a portion of U.S. 95 northwest of Babbit in Mineral County. **Silver State Construction Co.**, Fallon, received a $278,525 contract for the construction of a portion of the State Highway System on State Route 5C (Charleston Blvd. underpass and approaches) in city of Las Vegas, Clark County.

NEW MEXICO

Skousen-Hise Construction Co. of Albuquerque submitted a low bid of $1,199,458 for 2.9 mi. of grading, surfacing and structures, Raton-urban, Colfax County. A low bid of $705,043 was submitted by **Wylie Bros. Contracting Co.** of Albuquerque for 5 mi. of grading, surfacing and related work on U.S. 60, Clovis Cannon Air Force Base, Curry County. **James Johnson** of Santa Fe submitted a low bid of $425,361 for 7.4 mi. of grading, surfacing on State Highway 17, Dulce, Lumberton and Monero to Junction U.S. 84 in Rio Arriba County.

OREGON

C. R. O'Neil of Creswell submitted a low bid of $305,897 for 1.5 mi. of grading and surfacing on the Cascade Locks section of the Columbia River Highway, east of Cascade Locks in Hood River County. **Warren Northwest, Inc.**, Portland, submitted two low bids for work in Deschutes and Benton counties: $228,043 for grading and paving on 8.3 mi. of the West Unit, Fort Rock Road-Brothers section of the Central Oregon highway, east of Bend in Deschutes County and $132,330 for 8.3 mi. of paving on the Corvallis-Hughes road section of the Pacific Highway, south of Corvallis in Benton County. **McNutt & Sons, Inc.** of Springfield submitted a low bid of $168,041 for 3.7 mi. of grading and oiling, Middle Unit, Post-Camp Creek section of the Paulina Highway, southeast of Prineville in Crook County.

UTAH

Morrison-Knudsen Co., Inc., Salt Lake City, submitted a low bid of $1,392,390 for 4.9 mi. of grading, surfacing and structures on Interstate Highway 15 between American Fork and Orem in Utah County. **M. Morrin & Son** of Ogden submitted a low bid of $846,112 for construction of Union Building, Weber College, Weber County.

WASHINGTON

Osberg Construction Co. of Seattle received a $788,711 contract for a channelization project, constructing a concrete bridge and fencing on a portion of State Highway 1-A in the city of Snohomish, Snohomish County. **J. J. Welcome Construction Co.**, Redmond, received a $253,636 contract for 1.7 mi. of grading, draining and surfacing on State Highway 1-Y, near Stanwood in Snohomish County. A $130,700 contract was received by **Ray Weist** of Yakima for draining, grading and surfacing on 6.5 mi. on two roads, Branch road and Larue road, southwest of Wapato in Yakima County. **Fred H. Slate Co.** and **E. C. Hall Co.** of Portland, Ore. received a $517,895 contract for grading, surfacing and related work on 2.2 mi. of State Highway 1-S, southwest of Lake Merwin in Cowlitz County. **R. L. Moss & Co.** of Zenith received a $183,780 contract for channelization on 8 intersections on State Highway 2 between Kenmore and Bothell in King County. **James I. Barnes Construction Co.**, Seattle, received a $1,135,000 contract for construction of University of Washington Business Administration Building, Unit II. **General Investment Co.** of Longview, submitted a low bid of $5,395,000 for construction of 330 Capehart housing units at the Larson Air Force Base. **H. Halvorson Construction Co.**, Seattle, received a $1,683,883 contract for Residence Hall at State College, Pullman. **Brazier Construction Co.**, Seattle, submitted a low bid of $1,200,000 for construction of Securities Building addition, Seattle. **Lewis Hopkins Co.**, Pasco, submitted a low bid of $1,213,629 to the U. S. Bureau of Reclamation for construction of 46.2 mi. of laterals and wastewavs in Block 80 of the Columbia Basin Project northwest of Othello in Grant County.

Letter to the Editor

Sir:

We note the subject article (California's First Slip-form Highway Paving Project) in the January *Western Construction* is at some variance with the facts.

Under "Advantages" the grade crew was indicated as being five men. The truth of the matter is that the grade crew of four men could readily set stakes for 2,400 cubic yards of concrete in 8 hours, and did. Further, this crew was used elsewhere when not needed on grade work.

The article further states that the crew on the machine was nine men. When these people got strung out, the crew was actually: 1 laborer setting tie bars in front, 1 operator, 2 grade men, 2 finishers, 1 laborer between pavers and slip-form.

This is actually a crew of six as the laborer setting the tie bars is hardly chargeable to this operation and then the sixth man, the laborer between the paver and the slip-form, was actually cleaning up around the paver as much as working relative to the slip-form.

On Ball's job at Winters, they elected not to use subgrader equip-

ment, principally because they felt that they could stay within the State's permitted tolerances for which they would get paid.

Almost immediately when the slip-form was put on the job, it became apparent that their "eyeball" approach to the subgrade was going to cost them some money, and actually they suffered some loss, as their subgrade was not so well controlled as to remain within the allowable paid tolerance.

We do have subgrade equipment available and further its ability is above reproach or question and it is *economically* practical.

As far as working close to structures is concerned, actually we work as close to structures as they are working with their present equipment and with a little attention to the problem, even this can be reduced. Actually we can get within about ten feet of either side of a structure without difficulty.

The article states that there is practically no margin for error in the concrete batching and mixing. Nothing could be further from the truth as one of the major advantageous characteristics of this work and our means of accomplishment is that we admix the various batches to get a homogeneous material rather than the individual batches without being admixed as is presently being done in conventional methods of placing material on the slab ahead of the spreader.

With respect to the comment that much roughness was encountered during the final four days when 1½-inch maximum aggregate was used, we would call your attention to the fact that the State was constantly making tests starting and stopping the machine, changing the mix, and changing the cycle of vibration during this period, all of which contributed to the roughness of the final days.

Further, the contractor's superintendent's comment relative to rental cost, "Rental of the Slip-form also is relatively high" is based upon his cost experience in the beginning of use. Examination of the rental rates when applied to the conditions after they leveled off shows excellent economic justification. In the first job, the amount of gain to the contractor is limited only by the ability of the contractor to integrate the machine into his whole operation. In succeeding work the gains stabilize.

R. M. Guntert, President
Guntert & Zimmerman
Stockton, Calif.

ENGINEERS and CONTRACTORS

Joseph H. Shea, formerly chief of the Army Section, Corps of Engineers, Los Angeles District, has been appointed chief of the newly organized Ballistic Missile Section of the Corps. He is a member of the American Society of Civil Engineers and a registered engineer with the State of California. Shea's new position will be as a liaison between the Ballistic Missile Division in Inglewood and the Corps of Engineers.

* * *

William R. Johnson, chief of the concrete control section of the Foundation and Materials Branch of the Engineering Division of the Portland Army Engineer District, has retired to accept a position in Iran, to work on Dez Dam, first major river control structure in that country.

* * *

William E. Willey, chief engineer of the Arizona State Highway Department, who is well known throughout the West for his significant services in the field of highway engineering, was recently honored by the University of Arizona and received its medallion of merit in recognition of his many engineering achievements.

* * *

Howard S. Cox has taken over the post of assistant county-city relations engineer in Salem for the Oregon State Highway Department. He replaces **John F. Hagemann** who moved up to assistant deputy civil defense director for the Department. Cox has been senior resident engineer at Brookings.

* * *

Last month we reported the resignation of **Edward L. Pine** as state highway engineer of Nevada and the elevation of **W. Otis Wright** to the top post. Subsequently, **Reuben Eldredge** and **John Bawden** were appointed to serve with Wright as deputy highway engineers.

Otis Wright had been assistant highway engineer under Pine since early last year. He began his career with the highway organization in 1922, moving up through the ranks to his present office. Eldredge will supervise field operations of the Department. Prior to his present assignment he was chief construction engineer. Bawden, chief road designer since 1956, will be in charge of all engineering operations at headquarters.

* * *

R. W. Fisher, Jr., formerly principal engineer with Kaiser Engineers, Oakland, Calif., has been elected to a vice president of Kaiser Engineers Overseas Corp. His first assignment is that of project manager of a portland cement plant to be constructed in India.

* * *

Two appointments are announced by the East Bay Municipal Utility District. **Gordon Laverty,** Oakland, was appointed supervising sanitary engineer. Ten years with EBMUD, Laverty is a vice-chairman of the San Francisco Section of the American Society of Civil Engineers. **William T. Kritikos,** Oakland, also a civil engineer, has been named superintendent of the mechanical and electrical maintenance section. He has been with the district since 1948. Both men were selected on the basis of civil service examination.

* * *

Recent reassignments among the resident engineers of the Utah State Road Commission follow. **Carl M. Fennesbeck** to a 3.2-mi. grading and draining job on Interstate Highway 15 under way by Jack B. Parson, contractor. **Sherman Burton** to highway construction along Interstate 15 for 4.4 mi., a 125-day contract held by L. A. Young Sons. **Phillip Lundell,** construction by Floyd S. Whiting, for extending for 6.5 mi. to straighten out curves and inclines through canyon on U.S. Highway 50 and 6. **Stanley Van Orman,** 56-ft. span over Weber River on State Road 196, a contract soon to be completed by Max Jones, contractor.

Robert B. Diemer, general manager and chief engineer of the Metropolitan Water District of Southern California, was awarded the 1960 Missouri Honor Award for Distinguished Service in Engineering, presented by the University of Missouri. Diemer has been associated with the Metropolitan Water District for more than 30 years. It has been under his direction that a $200,000,000 program has been carried forward to bring the Colorado River Aqueduct to its full capacity.

* * *

Northwestern Engineering Co., Denver, Colo., has appointed **Cliff Murphy** as district manager for the Denver district.

Harvey Slocum announces the establishing of a construction consulting service in partnership with **H. H. Roberts,** under the name of Slocum & Roberts. The firm will specialize in heavy construction project investigations, planning, estimating and bidding, plant layout and management. Slocum will operate from 504 East Pine St., Alhambra, Calif. Roberts will have headquarters in Lakewood, Ohio.

Maj. John F. Kimbel, executive officer of the Portland Army Engineer District since last September, has been named deputy district engineer.

* * *

W. A. Bugge, director of highways of Washington, has been assigned by the Washington Toll Bridge Authority as engineer for the Hood Canal floating bridge project. **Charles E. Andrew,** chief consulting engineer with the Authority, is retained as a consultant, but he will not be concerned with the Hood Canal project.

* * *

George R. Strandberg, 71, died recently in Newton, Mass. Nationally known for his achievements in developing some of the country's greatest dams and power systems, and associated with Stone & Webster Engineering Corp. for 42 years, Strandberg was most recently identified in the West as a consulting engineer for Rocky Reach Dam project on the Columbia River.

EPOXY ADHESIVES IN CONSTRUCTION

...a product-in-use bulletin from **ADHESIVE ENGINEERING**

NEW HIGH-STRENGTH CONCRESIVE® SLASHES COST OF CONCRETE REPAIRS

A broad new range of construction and repair techniques, effective on any job where concrete is used, have been opened up by the development of the new epoxy adhesive, CONCRESIVE.

In most instances this new adhesive makes it possible to bond concrete to existing surfaces with strengths and permanence not previously obtainable. Cost of normal concrete repairs often can be reduced at least 50%. Numerous other useful applications exist: for example, CONCRESIVE will bond metals, stone and similar structural materials to concrete, asphalt, and to each other.

Time savings in all uses are substantial.

CONCRESIVE in liquid form permanently bonds fresh concrete to old in overlaying bridge decks (see illustration), dam surfaces, floor slabs or sidewalks. It also is unmatched in strength and ease of application for building up grades, eliminating depressions and bonding extruded concrete curbing.

Spalled surfaces—otherwise structurally sound—can be repaired without ripping out old concrete and replacing it with a fresh pour. The economies obtained are apparent.

CONCRESIVE paste adhesive fills cracks and voids easily and economically in foundations, walls or ceilings. It is non-sagging, easy to butter and sets quickly. This paste-form epoxy adhesive also permanently bonds masonry, marble, metals, stone, slate, and similar structural materials, in almost any combination.

CONCRESIVE binders and grouts are formulated to Air Force and Corps of Engineer specifications for repairing spalls and other defects in all types of concrete structures including airport runways. Cost of permanent joint repairs by this procedure (see illustration) is minimal compared to that of replacing entire slab sections. CONCRESIVE epoxy-polysulfide grout also has solved the problem of anchoring steel dowels into airfield runways, as a means of distributing heavy bomber landing loads to adjacent slabs—after tests with regular cement grout had failed.

Numerous other specific examples of time and cost savings with CONCRESIVE epoxy adhesives are available. Additionally, our sales engineers will train contractor crews in the proper application of CONCRESIVE, without cost or obligation.

Contractors, engineers and other industry officials will find it valuable to become familiar with the properties, techniques and advantages of these new epoxy adhesives. For complete information including technical data and illustrated literature, phone or write: ADHESIVE ENGINEERING (Division of Hiller Aircraft Corp.) 1411 Industrial Road, San Carlos, California, Telephone LYtell 1-2686.

Bridge Deck Topped in Hours!

SKAGIT RIVER, WASHINGTON--A 150' x 14' section of newly-poured concrete deck on this logging bridge was severely spalled by freezing temperatures. Ordinarily, the contractor would have ripped out the old deck completely, then re-poured it. Instead, he removed unsound material... brushed on high-strength liquid CONCRESIVE...and in less than 3½ hours, overlaid the entire 2100 sq. ft. surface with concrete varying from ⅜" to 2" thick. Old and new concrete were permanently bonded with strengths greater than either!

Economical repairing of spalled concrete joints by simple troweling-in of CONCRESIVE mortar, followed in hours by saw-cutting to receive sealing compound and free slabs.

Epoxy Adhesive Excels for Bonding Safety Devices

CONCRESIVE formulations have proved an ideal choice—in all climates—for bonding signposts, traffic bars and buttons, or other objects to concrete and asphalt pavement. These epoxy adhesives are equally useful on construction projects—wherever bolts, pins, fittings or load-bearing devices must be anchored in concrete with permanence and great strength.

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... for more details, write No. 63 on Reader Service Postcard

A. A. Anderson, 67, died recently in Mount Vernon, Wash. A resident of Anchorage, Alaska, for 43 years, as a civil engineer he is credited with much of the development of Alaska. At one time he was assistant chief engineer for the Alaska Railway. During War II he was chief Army Engineer in charge of airfield construction on Attu.

* * *

Hans A. Feibusch, formerly senior design engineer for Ben C. Gerwick, Inc., announces the formation of his own consulting engineering firm in San Francisco. The firm will specialize in consulting for contractors on heavy construction problems and special equipment, as well as equipment for the manufacturing of prestressed concrete products.

* * *

John R. Thatcher, assistant to the chief of the Engineering Division of the U. S. Army Engineer District, Walla Walla, Wash., died suddenly Mar. 1. He was a 32-year veteran with the Corps.

INSPECTING rubber expansion joints extending 75 ft. across the ends of a new taxiway just completed at Lemoore Naval Air Station in California are: Capt. V. C. Bertelsen (CEC), USN, resident officer in charge of construction; A. Kinnamon, project superintendent for Griffith Company; and E. O. Bergholdt, Griffith project engineer. This is the first installation of B. F. Goodrich rubber joint for aircraft use. The joint acts like the bellows of an accordian to absorb expansion and contraction, yet stays level with the concrete surface. The new Master Jet Base is scheduled to be operational in 1961.

Max R. Johnson has been named construction engineer for Prosser Creek Dam, a $2,181,323 earthfill structure to be constructed by the Bureau of Reclamation as part of the California-Nevada Washoe Project. Presently Johnson is in charge of the earthwork construction at Trinity Dam near Lewiston, Calif., and is being promoted to the post of supervisory dam construction engineer, with headquarters at the Lahontan Basin Projects Office at Carson City, Nev.

* * *

John N. Bills has been named by the East Bay Municipal Utility District, Oakland, Calif., to a newly created administrative position. He has been serving as executive assistant to the general manager and has now become assistant manager of the operations and maintenance division. A graduate civil engineer, Bills joined EBMUD a few years ago.

* * *

William S. Kaplan, consulting structural engineer, has opened offices at 268 Market St. in San Francisco.

* * *

Establishment of a Southeastern Alaska office is announced by the U. S. Army Engineer District, Alaska. Resident engineer for the new office is **Maj. Alfred H. Victor, Jr.,** who will maintain offices in Juneau and at District headquarters at Anchorage. Major Victor has been resident engineer at Shemya, located near the tip of the Aleutian Chain, for the past two years. His successor here is **Ellis W. Morgan,** who has been assistant resident for the past year and a half.

* * *

The engineering division of J. H. Pomeroy & Co., Inc., located at Los Angeles since 1952, has been moved to the new Pomeroy building in San Francisco.

Announcement is made by the Oregon State Highway Department, Salem, of the appointment of **Victor D. Wolfe,** chief locating engineer, to the position of administrative assistant to **W. C. Williams,** state highway engineer. With this change, Wolfe will provide professional engineering services to counties and cities and deal with technical and community problems which arise as a result of highway construction.

* * *

Odegard Construction Co., general contractor, Everett, Wash., is extending its services into the field of over-all responsibility for complete design, coordination and management of construction jobs. **Robert J. Denamur,** long connected with Howard S. Wright Construction Co. of Seattle, has joined the Odegard company as its secretary-treasurer. Another man with extensive construction experience who recently joined the organization is **John A. Johnson,** vice president.

* * *

The Structural Engineers Association announces the election of new officers for its Washington state organization as well as for its Seattle Chapter. **Harold L. Worthington** was elected 1960 president of the state association, while **Horace J. Whitacre** of Tacoma will head the Seattle group.

* * *

Frank J. Barrett, former district manager of the Portland Cement Association, died Mar. 4 in Seattle, Wash. He retired in 1954.

CALENDAR

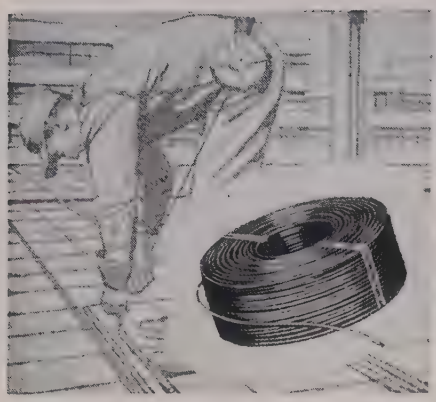
Sept. 19-21 — National Highway Conference for County Engineers and Officials, Atlanta Biltmore Hotel, Atlanta, Ga.

Sept. 27-30 — Prestressed Concrete Institute, annual convention, Statler-Hilton Hotel, New York City.

Oct. 10-13—American Mining Congress Mining Show, Convention Center, Las Vegas, Nev.

Oct. 17-21 — National Safety Council, annual national safety congress, Chicago, Ill.

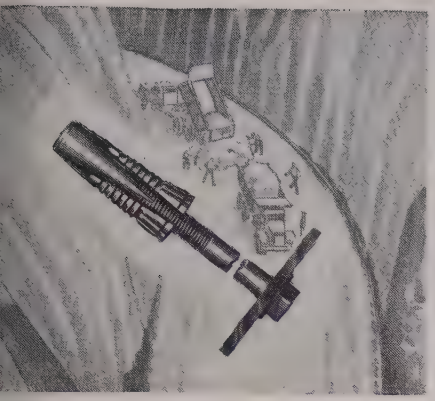
Nov. 28 - Dec. 2 — American Association of State Highway Officials, annual convention, Detroit, Mich.



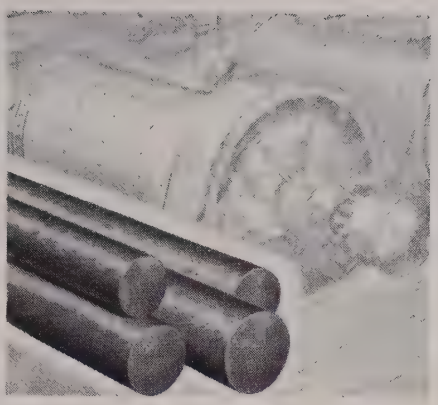
CAL-TIE WIRE – For fast tying of rebars or welded wire fabric, equip your workers with this quality wire in the handy, belt-borne reel. Wire can't snag, kink or tangle and there are no loose ends to scratch hands or face.

WIRE ROPE – There's a CF&I-Wickwire Rope or Sling for every type of construction job. These tough, rugged ropes withstand plenty of punishment. They are available in many constructions, sizes and grades. For extra safety, extra strength and longer life, specify Double Gray-X.

VIBRATING SCREENS—You get your choice of metals, weaves, meshes and edging to suit any type of sizing operation or any vibrating equipment. The long life of CF&I Space Screens allows you to operate at minimum cost per ton screened.



ROCK BOLTS AND METALLIC FABRIC – For safe, dependable lagging in tunnels and through cuts use CF&I Rock Bolts. Realock Metallic Chain Link Fabric gives essential support between bolts and protects against falling rocks or slides. Rock Bolts are available in either expansion type with Pattin Shell or in slot-and-wedge design.



GRINDING RODS—Made from special analysis high carbon steel, CF&I Grinding Rods are rolled to close section tolerance. These rods, manufactured specially for processing of sand and gravel, are then machine-straightened to insure uniform rotation needed for good grinding. These rods will not bend or break prematurely.

Depend on CF&I's Family of Steel Construction Products

On projects everywhere, construction men keep the work humming with CF&I Steel Products. Long-range dependability—as symbolized by our Corporate Image—is built into every CF&I product.

CF&I makes steel products that are widely used right on construction job sites—products like tie wire, wire rope, rock bolts, grader blades and many others. Contractors also use other CF&I products – such as grinding rods and vibrating screens—for preparation of materials.

When you need replacement parts, such as a new grader blade, CF&I can get it to you without delay, either from a company warehouse or from one of our many distributors. For prompt delivery or complete information on any CF&I steel product, call our nearest sales office. 7470

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. . . for more details, write No. 66 on Reader Service Postcard

SUPERVISING the jobs

"Hank" Kaiser, crusher superintendent, and **Jess Dockery,** hot plant superintendent, are key men on a $166,742 contract in the hands of Summit Construction Co. Located between Newcastle and the South Dakota state line in Weston County, Wyo., work consists of grading, surfacing and related items on a 7-mi. stretch. Under way since January, job is expected to finish in July.

* * *

A. V. Hales is superintending Tiago Construction Co.'s contract from the Bountiful Water District, Bountiful, Utah, for pressure-irrigation system costing $939,754. Assisting as pipe foremen are **Bob Green, Dale Paning,** and **Gene North.** Work started April 4, and **Jack Cook,** general manager of the contracting firm, reports it will be finished the end of June.

* * *

N. G. "Herk" Reynolds, superintendent, **Charles Lukin,** field office manager, and **William H. Horstmeyer,** purchasing agent, are key men working for Phoenix-Tempe Stone Co. which successfully bid at $264,709 job of grading and paving S. 7th Ave. in city of Phoenix, Ariz. Work started in March, with completion scheduled for June.

* * *

Jack Kent was named by Wilbur Christensen Co. to supervise 11.8 mi. of grading, surfacing and related work on the Grassrange-Malta road in Silver Bow County, Mont. The $366,519 project was scheduled for April start.

KEY PERSONNEL on the Howard Hanson Dam project (formerly Eagle Gorge) pause for the *Western Construction* cameraman in front of the inlet portal of the diversion tunnel. Left to right are: *Norm Swanson,* superintendent for contractor Kaiser-Raymond; *"Chuck" Peterson,* project manager for K-R; *James F. Grafton,* resident engineer for the Corps of Engineers; and *Stanley Nelson,* a construction management engineer for the Corps and a visitor to the project. Project manager for the contractor until recently was *H. E. "Curley" Christman,* now in Kaiser's Oakland, Calif., headquarters working on programming of foreign and domestic projects in which the Kaiser organization is participating. See article which begins on page 49.

Most advanced of all ¾-yd. loaders! A real *production* loader, the Oliver 778 cuts time and work schedules to figures no other can match. Fully framed for strength that makes profits year after year. Torque converter automatically adjusts to the load—you get a full bucket every time!

It's quick as a flick...

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SUPER-SPEED LOADERS

You'll hustle through every job with an Oliver loader—made even faster with "Reverse-O-Torc," the torque converter that saves you time and money. No shifting, no clutching—just flick the lever and you change direction forward or backward instantly. With "Reverse-O-Torc" you'll roll out more work cycles per day and wheel in more profits for yourself!

Speed-test either of these top-production Oliver loaders. Match the tractor and equipment to suit your needs and get the work package that gives you the most earning power for your money.

And check the other models in the all-purpose Oliver wheel line: the handy Oliver 550, compact-sized loader that gets in and digs where others can't go; the big-muscled Oliver Series 900's, most proved high-powered wheel tractors built!

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LOOK TO OLIVER FOR YOUR BEST BUY IN WHEEL AND CRAWLER TRACTORS

Fastest loader in the 1-yd. class! That's the Oliver 888! Powerful hydraulics provide maximum down pressure and deep penetration. Add "Reverse-O-Torc" and you have an unbeatable money-making combination. Engine torque is multiplied more than twice over—you're always in the right gear ratio for your work.

... for more details, write No. 67

CONSTRUCTION of Phase II of the medium security facility near Los Padres for the California Department of Corrections is now in progress. Johnson, Drake & Piper was the successful bidder at a $2,363,000 figure. Phase I had been awarded to JD&P on a low bid of $7,844,000. Thirty-one buildings are included in total contract for Phases I and II, and 35,000 cu. yd. of concrete from the contractor's batch plant are being used. Shown above are some of the JD&P key personnel. Left to right: Kneeling, *Ken Comer,* timekeeper; *Hal Boyle,* concrete foreman; *Gordon Lindsey,* superintendent; *Ken Nation,* carpenter foreman; *"Chuck" Borden,* visiting JD&P national safety director. Standing, *Bill Comer,* office manager; *Clarence Bond,* cement finisher foreman; *Del Coates; "Chuck" Ross,* carpenter foreman, and *Bob Harris,* mill foreman. Project has been under way since January 1959, with March 1961 the target date.

Charles Prose is superintending a $251,177 job for Heiskell Construction Co., consisting of 10.7 mi. of grading and surfacing on State Route 64 west of Flagstaff, Ariz. **Pat Murphy** is foreman on this work which will be finished about the end of July.

* * *

Richard Ash, superintendent, assisted by **Del McConnell,** foreman, is in charge of Purvis Construction Co.'s award covering general work on addition to the technology building at Washington State University, Pullman. Purvis' bid was $802,824.

* * *

Delbert Phillips, project manager, and **Bob Brewer,** superintendent, are top men employed by Anderson Construction Co., general contractor, for a new high school in Olympia, Wash. Contract price was $1,454,643 with alternates. Carpenter foreman is **Arne Backman.** Under construction since late last October, the project is expected to be finished about Dec. 1.

Jack Brown is grading superintendent, and **Jim Pollard** is drainage foreman for a $725,392 award to Roy L. Houck Sons' Corp. covering 3.3 mi. of grading, and 3 structures on the Evans Creek-Homestead section of Pacific Highway, Oregon. Office manager is **Harold Perky.** Started the first of April, the job will be complete about Sept. 1.

The above three men are also handling a nearby grading job being done by Houck. This is a $794,219 contract for 2.1 mi. with 3 structures on the Homestead-Rock Point section, which work will be finished Oct. 1.

* * *

Harold O. Kester, project manager, **Ed H. Thomas,** project engineer, and **Francis DeMuth,** general superintendent, are top men on construction of the reinforced concrete powerhouse for the Corps of Engineers at Fort Peck, Mont. Project is being built by Eagle-Western, a combine of Eagle Construction Corp. and Western Paving Construction Co. Other key personnel on this job are **Fred Evans,** general carpenter superintendent; **Jim Decker** and **Carl Nix,** carpenter superintendents, **"Buck" Butler,** mechanical superintendent; **Bill Stapp,** assistant project engineer; **Manson Bailey, Jr.,** field engineer; **Jack Heavener,** purchasing agent; **Al Schartner,** paymaster. Office manager is **Gregg Geis.** The $6,300,000 undertaking started in January 1959, with June 1962 the target date.

L. H. OPPENHEIM, general manager of Kaiser Engineers, presents project specifications to *C. P. Bedford, Jr.,* upon signing of contract between the U. S. Army Engineers and the joint venture of Kaiser-Raymond-Macco-Puget Sound. Bedford is resident manager for the combine which has recently started the construction of three Titan missile launching bases for the Army near Mountain Home AFB in Idaho. General superintendent for this $28,899,000 project is *Bert Provost,* and construction engineer is *C. M. Morris.* Work will be finished about April 1962.

NEW CAT DW20-482 TEAM

HAULS BIG LOADS FAST, INCREASES PRODUCTION

Six-minute cycles on nearly a two-mile round trip hauling 24 bank cu. yd. of slow-loading sand! This is the production from two big Cat DW20G Tractors with new 482 Scrapers speeding road construction on State Highway No. 99 in Marshall County, Oklahoma. The big rigs are owned by the W. D. Jeffrey Construction Company of Fort Smith, Arkansas, contractors on this job.

"The new DW20 and 482 Scraper have a faster cycle and loading time which means higher production," comments Superintendent "Smoky" Branson. He adds, "Down time on equipment is minimum."

The DW20's 345 HP results in 12% increase in rimpull over the former model. This provides up to 20% faster travel speeds under similar haul road conditions. The 482 Scraper is teamed with the DW20 for high production with its 24 cu. yd. struck load capacity (34 cu. yd. heaped). On this job the DW20-482 combination loaded in .93 minute.

Field reports from contractors all over the country confirm the productive efficiency of the big DW20-482 combination. Get the facts from your Caterpillar Dealer. He can prove—right on your job—that economical, high production is built into the new DW20 and 482.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

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PICK THE DW20-482 TO BREAK PRODUCTION RECORDS

... for more details, write No. 70 on Reader Service Postcard

CONSTRUCTION BRIEFS

Rock-filled mattress makes lumpy bed for Colorado River

IN 1927 WHEN Otis Pierson was construction foreman for the then new Arizona-California bridge at Blythe, footing protection was accomplished with reeds, stones, willow branches, and anything at hand that could fill a flexible woven wire mattress.

In May 1959, as president of O. B. Pierson, Inc., Otis Pierson was on hand to witness the dredging up of the steel wire remnants of that old mattress when ground was broken for the new interstate bridge just a few yards upstream from the old.

This new job, a $996,000 contract awarded to the Osborn Company and O. B. Pierson, Inc., as a joint venture, will provide, upon completion in late 1960, a 33-foot, 8-inch wide, two-lane bridge parallel to the old. Another parallel bridge with two traffic lanes is planned for the future to bring this highway to interstate highway standards.

The State of California, Department of Public Works, Division of Highways and the State of Arizona, Arizona Highway Department are building this bridge as a joint venture. The California Bridge Department, Design Section Nine, developed the design and accomplished the engineering for the project.

Currently construction is focused on the completion of the six support piers. This construction was begun before the existing highway siphon was extended. The bridge is 1,113 ft. long and 25 ft. high. It will be supported by four piers in the river channel and by abutments on the east and west banks.

As each channel pier is completed, a flexible rock mattress, 100 feet square and some 18 inches deep, is assembled around it. The mattresses are constructed at grade, some 18 feet above footings. Steel pilings extend 50 feet below the footings through very loose to slightly compact brownish-gray fine sand to a dense gravel and clay foundation.

The mattresses were designed as an emergency protection measure for the footings. Currently the Colorado River is flowing at a normal rate of 6 to 7 mph. But if any of the upstream dams such as the Weir (12 miles upstream), Parker, Davis, or even the Hoover Dam were forced to open flood gates, the flow at the Blythe point could increase significantly.

This increased flow could erode the loose, fine sand between the footings and the mattresses. If erosion should occur to this degree, the heavy boulder-filled mattresses would settle slowly around the footings and the mattresses would provide a riprap to protect the footings themselves from erosion or damage caused by the increased flow.

Assembly technique for a typical mattress consists of laying fifteen 100-foot continuous lengths of Bethlehem Steel's ½-inch wire rope on three-foot centers on each side of and parallel to the oval-shaped pier. Four more wire ropes, on three-foot centers from the perimeter, were placed laterally to the pier on each end.

A galvanized, welded 14-gage, 4x4 in. wire mesh was laid over the wire ropes and secured at 2 ft. centers with U-bolt clips. Boulders ranging from 75 to 150 lb. were placed over this pattern to a minimum depth of 15 in. A similar wire mesh/wire rope pattern was laid over the boulders and secured to the bottom pattern.

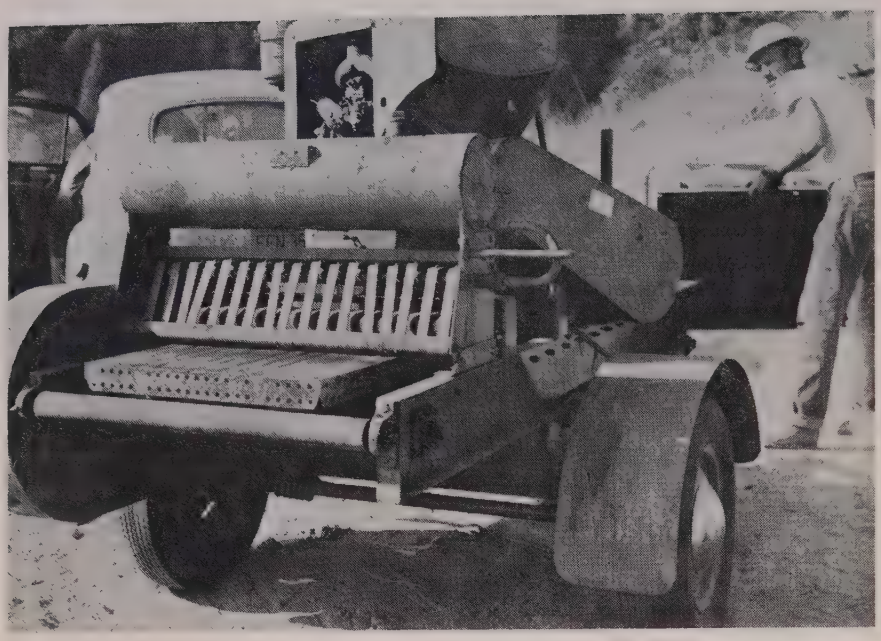
Ten-gage steel wire ties secured the bottom and top wire mesh together at 3-foot centers. The two layers of wire rope and mesh were further tied together by lengths of ½-inch wire rope clamped at the top side with U-bolt clips. A perimeter band of wire rope encircles the completed rock-filled mattress.

Granite and limestone rock for the mattress fill material was taken from a quarry 15 miles north of the site. A total of 33,000 feet of wire rope and 800 cable clamps were utilized to secure the total 4,240 square yards of the four mattresses.

Welding accessory catalog

A new 16-page arc welding supply catalog gives information on the complete line of **Hobart** arc welding accessories and supplies including: headshields, grinding shields, goggles, cleaning tools, electrode holders, cable connectors, ground clamps, work holding clamps, welding cable, protective clothing, welding gloves and miscellaneous equipment.

. . . Write No. 500



Coating machine sprays emulsion on concrete forms

PRODUCTION coating of steel forms with a new emulsion type form release agent is saving time and cutting application costs on construction of bridge culverts, overpasses and retaining walls on the Orinda-Danville throughway in California. This 2½ mi. link, which will connect the Orinda and Lafayette freeways, is a joint venture of the Gordon H. Ball Company, Danville, and the Ball & Simpson Construction Company.

The contractor needed a more economical and faster way to coat steel forms because of the number of concrete structures to be built on this and other projects. Formerly, the 4 x 24 x 48 in. forms were manually sprayed with a conventional form oil. Apart from the initial high cost of the material plus the labor required to apply it, the company wanted a more stable form lubricant which would still be serviceable even if concrete was poured weeks after forms were locked up.

Mechanized coating was first used on the steel forms for a concrete retaining wall 18 ft. high by roughly 180 ft. long.

Ordinarily, coating the number of steel forms for a concrete wall of this size would have required at least 40 gals. of the conventional form oil. By switching to the Shell Oil Co.'s new Form Compound, MacDonald was able to coat all of the forms with less than 25 gals. of the emulsion type release agent, and in half the time.

One part of Form Compound was mixed with 10 parts of water just before use, resulting in an emulsion cost of less than 20¢ a gallon.

The emulsion was applied by a gasoline-powered coating machine manufactured by Economy Form Corp. Operation is quite simple—forms are fed in at one end and taken off at the other. A pipe feeds the emulsion from the tank to a tube equipped with a series of nozzles. As the rubber belt conveyor carries the forms through the mechine, the material is automatically sprayed onto a soft felt roller. The saturated roller coats the entire steel surface of the form with an even layer. This method also removes dust and eliminates the necessity of cleaning forms before coating.

Just one application of the solution is needed to assure quick and easy stripping of forms. Concrete surface after stripping is clean and smooth without pits, holes or stains.

Contractor also reports that hand spraying the Form Compound solution on large wooden forms has done away with the form build-up caused by the conventional form oil.

. . . for more details, adv. opp. pg., write No. 71 on Reader Service Postcard ⟶

$4,000,000 airport terminal project under construction at Salt Lake City

MODERN terminal facilities for Salt Lake City Municipal Airport are being constructed under a $4,000,000 contract by Christensen Bros. of Salt Lake City.

The project consists of a main air terminal building with control tower, north and south ramp buildings, north and south passenger concourses, and a utilities building. Basement and first floor of the terminal are of reinforced concrete, with structural steel, glass and precast panel facing above.

All structures rest on a foundation of driven Raymond step taper piles, totalling about 400. About 9,000 cu. yd. of reinforced concrete are used, requiring some 90,000 sq. ft. of forming.

An unusual design feature of the new administration building was the use of special acoustically-efficient materials in the front columns facing the parking ramps. Although this will be a large, glassed-in area, where passengers can look out over incoming and departing planes, there will be little noise, even when jet engines are run up. The reason is the use of structural steel vertical columns, surrounded by special perforated metal tubes filled with Styrofoam. This material has the peculiar property of absorbing noise like a sponge does water. There will be no ear-splitting discomfort from screaming jet engines.

Forming of the extensive concrete foundation and substructure was done with Symons Clamp & Mfg. Co. Steel-Ply line of concrete forms. These come in factory-made panels of 2 x 3, 2 x 4, 2 x 5, 2 x 6, 2 x 7 and 2 x 8-ft. sizes and have steel edges and corners and steel backing, with the plastic-coated plywood face.

The pre-fab forming system has been used in all parts of the building, including 12-in. thick basement walls which were fairly well cut up with electrical installations, openings and so on. Several times, when electricians forgot to install outlet boxes, they were able to remove one panel from the middle of an entire 14-ft. high section, install the box they had forgotten, and button the thing back up in a matter of minutes. The forms were also used on pile cap foundations, and on 20 x 26, 16 x 26, and 10 x 12 in. concourse beams.

A crew of two men handled forming of the numerous 12-in. square passenger concourse columns, completing seven columns a day. Each morning, the men stripped the forms from the previous day's pour, set them up again, set the wedges in place, and got them poured.

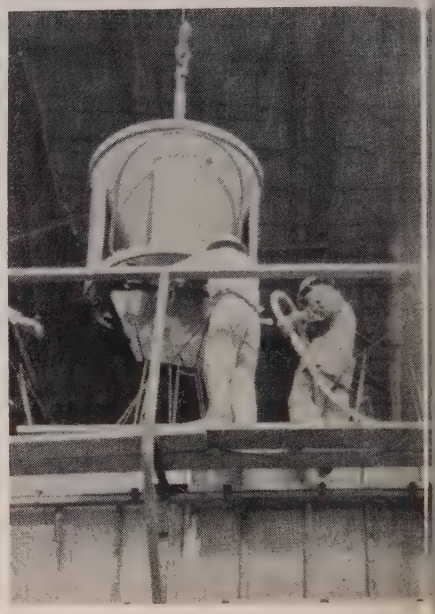
Perhaps one of the hardest pieces of forming was a double-flared, curving wall, of varying height, directly in front of the administration building. It was formed by constructing the foundation, outlining the curve, and then stacking the forms on steps which had been poured in the foundation. By using channel-type filler strips between the panels, both front and back, the curve was formed and poured mortar tight.

NEW RIO VISTA BRIDGE COMPLETED

THE SOMEWHAT ugly, outmoded bridge across the Sacramento River at Rio Vista has been replaced by this handsome crossing of structural steel and concrete. General contractor and builder of the bridge's superstructure was *Yuba Erectors* of Emeryville, Calif. *Lord and Bishop* provided the substructure. The $2,200,000 bridge has an overall length of 2,450 ft. The lift span is 306 ft. long and allows a clear channel width of 269 ft. between the fenders. The old bridge allowed only a 200-ft. clear channel. A vertical clearance of 135 ft. above high water has been provided. Twenty-two hundred tons of structural and 115 tons of rebar were required. The new bridge was constructed parallel to the previously existing bascule bridge and approach spans, and it was necessary to keep vehicular as well as river traffic flowing. This was accomplished by cross-overs from the new to the old bridge as construction progressed. The Rio Vista Bridge project fits into the overall plan for providing passage of a greater volume of larger vessels along the Sacramento River. (Bascule section of the old bridge being demolished in background.)

Void problem solved in concrete columns

THE HOFFMAN Construction Co. of Portland was having trouble with voids on columns they were pouring as well as walls for the new Education and Recreation building in Portland. This meant extra finishing of the columns and walls after the forms had been stripped. The walls are 12 in. thick by 16 ft. high and 150 ft. long.



Pozzolith additives and air-entraining agents were combined in a pour of 2½-in. slump with 1-in. aggregate. On the wall they were vibrating continuously 280 yd. of concrete and on the columns they poured in 7 lifts of 23 yd. each, a total of 160 yd. per column.

Ross Vickers, superintendent, decided to try a high cycle vibrator to eliminate the void problem. He used a Stow HC-175-14 vibrator which operates at 180 cycles and was powered by a Stow HCG-1 generator. The generator was put on the ground and wires were run up to the vibrator. With the high amplitude of this vibrator, they found that after the forms were stripped they obtained a smooth finish, density of compaction in the concrete and a complete lack of voids or pockets, so there was no need to patch or grout the columns or walls.

Track pin press for small crawlers

A new, improved Track Pin Press, No. Y360-A, for servicing tracks on small crawler-type tractors, is announced by **Owatonna Tool Co.,** manufacturer of main

tenance tools and hydraulic equipment.

Operating time required for removing and replacing pins and bushings has been cut considerably by the Y360-A Press which incorporates a new 35-ton, single cylinder, double acting ram, and the OTC "Vanguard" Y-26 series two-stage hydraulic pump. Ram approach is now four to five times faster.

To facilitate handling of track, 5-ft. sections of track roller conveyor are available which may be bolted together to any desired length.

Tooling for the press has been designed to handle track used on the following tractor models: John Deere-40C, 420C, 430C, 440IC, 440ICD and MC; J. I. Case-200, 300, 310, 320, 400, 420, 500, 520, 600 and M-3; Oliver-OC-3, OC-4 and OC-6.

Press requires floor space of 40 x 16 in. without roller conveyors. It stands approximately 32 in. high.

. . . Write No. 154

SUPER SHOVEL MOVES 115 YD. IN 50 SEC.

THIS MONSTER stripping shovel under construction for a coal company by Bucyrus-Erie Co. will be as tall as a 22-story building, have a reach of more than a city block, and weigh 14,000,000 lb. With a swing speed of 25 mph., it can move a 173-ton load 460 ft. and be back for the next bite in 50 sec. The 12,200-hp. giant is more than twice as large as any previous excavator, is controlled by two hand and two foot levers, although the single operator must ride up a 5-story elevator to get to the controls. It will roll on 4 sets of dual crawlers, and will be automatically levelled by 4 hydraulic jacks with a 4,000-gal. hydraulic system. The shovel will be shipped to the site in 250 railroad cars and assembly will require 7 months. It is slated for operation in 1962.

NEW OFFICERS of EMSA's Los Angeles chapter are, from the left, L. V. Morgan, Cummins Service & Sales, secretary; Dan Stoddard, Lincoln Engineering, second vice president; Bob Moodie, J. A. Thompson & Son, president, and Wallace Yeoman, J. A. Thompson & Son, treasurer.

Bob Moodie elected president of Los Angeles EMSA group

BOB MOODIE, J. A. Thompson & Son, who for most of the last six months has been presiding officer at nearly all the gatherings of EMSA's Los Angeles chapter, was elected by a unanimous ballot to presidency of the group at the annual election of officers held during the March meeting.

Ralph Currier of Shaw Sales & Service moved up from second to first vice president and Dan Stoddard of Lincoln Engineering, former EMSA treasurer, will take over as second vice president. Wallace Yeoman, J. A. Thompson & Son, was elected treasurer and L. V. Morgan, Cummins technical service manager, replaced secretary pro tem Ken Miller. Installation of officers took place at a dinner dance and installation party in Long Beach in April.

EMSA Equipment Maintenance Supervisors Association
Los Angeles

The election of officers, an important event to an organization, is doubly so for EMSA's Los Angeles group. The incoming officers face some significant challenges.

"Programming for a group like this is a difficult job, and it gets worse with each meeting," commented one of the outgoing officers. He went on to point out that there are apparently few programs designed for the highly specialized interests of maintenance supervisors. He added that while many manufacturers have presentations designed to acquaint users with their equipment, few of them have come up with the kind of an information-packed program that could be used for EMSA's meetings.

Also facing the group of officers will be decisions on EMSA's expansion program. Word has been received that a nucleus is being formed in Hawaii and information has been sought by others in the Northwest.

Following election of officers, Oscar Sigurdson, service manager for the Crook Company, presented a short color film on use of the LeTourneau-Westinghouse C 'pull and tandem scrapers.

Lightweight safety shields for welding protection

Safety shields for on-the-job protection during welding and grinding operations and for use as machine curtains or partitions where safety and protection are required are supplied by National Cylinder

Gas Division of Chemetron Corp. The shields are available in four sizes ranging from 18 to 36 inches in height and from 42 to 72 inches in over-all length. They are made in three sections and can be assembled or taken apart in three minutes, NCG officials said.

Construction is of tubular steel with a black oxide finish. Connecting rods are inserted into the open ends of uprights to form the frame and the curtains are fastened to the frame with heavy snap fasteners. The curtains are of heavy olive drab duck with flame-resistant finish. They are guaranteed water- and mildew-resistant.

. . . Write No. 155

Speaker "killed" at Bay Area EMSA meeting

RALPH HALL, Clark Equipment Co. representative from St. Joseph, Mich., featured speaker at the April meeting of the Bay Area Chapter of Equipment Maintenance Supervisors Assn., was "killed" in a spectacular tractor crash at the start of the evening's program. Despite this handicap, however, he led a lively discussion of torque converter maintenance and cooling problems later in the meeting.

Bay Area

Hall portrayed the chief victim in a safety movie produced by Clark Equipment Co. in cooperation with the National Safety Council which was shown to some 35 members attending the monthly dinner meeting. In the film, titled "The Quota," Hall got clobbered when his brakes failed and his tractor went over a cliff. He was dumbed out by the heavenly immigration service because he was over the quota. Other applicants who were turned down included a crane operator who raised his boom into a high tension line; a tractor operator who ducked behind a machine to smoke in a fuel-ing area, and was flattened when the operator backed up; a signalman standing beneath the load when the crane cable broke, and so on.

Following the 30-minute film, Hall, along with Keith Burgess, service manager, and Fred Perdue, sales manager of Buran Equipment

Co., Oakland, Michigan distributors, discussed operation of the Michigan loader line. He stressed the importance of following manufacturers' recommendations on operating temperatures, oils and lubricants, and servicing. Hall noted that Type A oil was required in the torque converter, and in response to a question, stated that even the new Type C oils are not suitable since they break down under the heat and pressure under which the unit operates.

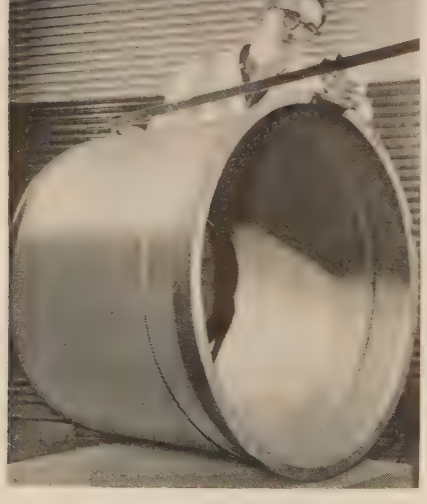
During the question period following, a member reported the problem of a Michigan loader torque converter overheating when it pulled a sheepsfoot roller. Vice-president Bob Leforce noted that he had solved a similar heating problem involving a Le-Tourneau-Westinghouse C Pull tractor pulling a 50-ton Bros compactor by running the torque converter oil through a pre-cooling radiator mounted in front of the engine radiator, and then through the regular cooling unit.

Giant 39-in. tire rim increases load capacity

Giant 39-in. diameter rims for large earthmoving equipment are in production at **Firestone Steel Products Co.**

The new large rim has been developed for high load capacity construction equipment which is now in design stages. The rim assembly weighs 829 lb. and is made of hot rolled steel.

The 39-in. rim is a result of the latest step taken by equipment manufacturers to increase pay load of dirt-moving rigs. The new rim, and its tire, have a 3,750 lb. greater load capacity than the previously standard tire and rim of 33-in. diameter.



An important feature of the Perma-Tite rim line is a new finish developed and used exclusively by Firestone. The paint, a red oxide primer, can be welded through and still protect the exposed metal from rust. It is not toxic.

A unique welding process developed and used exclusively by Firestone is used in manufacturing the larger rim sizes. The new welding process assures equal penetration for maximum strength. Rim components are joined by balanced submerged arc welds on both the inside and outside of the rim.

. . . Write No. 156

Engine spark trap has no moving parts

A new, vane type spark arrestor, adaptable to mobile and stationary internal combustion engines, has been introduced by the **Air-Maze Corp.**

The Air-Maze arrestor employs a centrifugal action principle without the use of moving parts. As the exhaust stream flows through the unit, the stationary vane imparts a spinning action to the air flow.

This rotary motion drives the heavy particles of hot carbon to the outside of the stream and into the spark trap. The straight flow action of the muffler places minimum back pressure on the engine. The trap can be cleaned by opening the cleaning port with the engine operating at idle speed.

Although not intended for use as a muffler, the unit's sound attenuation characteristics compare favorably with a "straight through" type truck muffler. Any ordinary muffler can be installed with the arrestor without loss of operating efficiency.

Standard models, available in aluminized steel with cast, ductile iron vane. They now may be ordered in four sizes to fit engines from 150 to 1,200 cubic inch displacement. The manufacturer will provide bushings to permit installation on non-standard inlet pipes.

. . . Write No. 157

Lightweight hoist has sealed housing

A compact, lightweight spur geared hand hoist with working parts totally enclosed in sturdy aluminum alloy housing and frame has been introduced by **Therm Machine Co.** This unit is offered in eight different sizes with lifting capacities from ½ ton to 10 ton.

The sealed housing design shuts out dust, dirt and weather, making

this hoist very adaptable to outdoor or indoor requirements.

The 3-ton capacity size weighs 70½ lb., including 10 feet of lift chain, and can be carried, placed or operated by one man.

Anti-friction bearings and factory sealed lubrication of gears assures maximum operating ease. A hand pull of about 75 lb. will raise a full capacity load. Hand chain is specially formed to be easy on hands. All chains are plated for rust prevention. *. . . Write No. 158*

New transmission fluids developed

Two new automatic transmission fluids—(1) Type A - Suffix A and (2) Type C—are now being marketed by Lubrication Engineers, Inc.

Both products have been certified as meeting or exceeding all

pecifications set forth by General Motors for Type A automatic transmission fluids and by GM's Allison Division for Type C automatic ransmission fluids.

Flash points for both LE's new Type A-Suffix A and Type C luids are above 400 deg. F., some 55 to 85 deg. above the usual flash oints for such fluids.

According to LE engineers, this extraordinary thermal stability results from the use of special blending oils in the manufacture of the luids. The resulting higher thermal resistance prevents the new LE products from "breaking down" under extreme operating conditions. A special oxidation inhibitor s another exclusive ingredient of ts new fluids.

Both products have passed rigid ests to assure that they will have no harmful effects on rubber seals.

. . . Write No. 159

New cutting torch handles 24-in. steel

A rugged duty cutting torch with low capacity which enables it to cut 24-inch steel has been introduced by Smith Welding Equipment Corp. under the trade name of "Tuf-Tony".

Primarily designed for heavy cutting under all conditions, this

ersatile torch adapts to a wide ariety of less demanding applications by use of different "Slip-in" ips.

An exclusively designed feature f Tuf-Tony is the "Ease-on" oxyen control valve which permits radual introduction of cutting xygen.

. . . Write No. 160

NEW LITERATURE

To obtain free copies of literature described in this section, write the corresponding numbers on reply postcard.

Replaceable tines for pulvi-mixer

Specification sheet for reversible replaceable spring steel tines for Seaman-Andwall mixers has been issued by **Orendorff Manufacturing Co.** Tines are made in 3-in. and 4-in. sizes and are combination right or left in both of these sizes. Manufactured of heat treated steel, they offer long wearing life and reduction in down-time.

. . . Write No. 161

Catch basin cleaner

A hand operated clamshell type catch basin cleaner called the Haines Handi-Clam is described in a small folder issued by **Haines Manufacturing Co.** Shown in operation, the unit is pushed into a catch basin in open position, the two halves of the clam are closed with a lever at the top of the handle and the material thus collected is pulled to the surface. The booklet lists two bucket sizes with 12 and 16-in. openings and handle length from 6 to 10 ft.

. . . Write No. 162

Brochure on portable conveyors for construction material

Job application photos of Mulkey portable belt and chain conveyor units are featured in a 4-page booklet issued by Sam **Mulkey Co.** The mobile conveyors are shown lifting transit mix concrete and gravel on belt type units as well as bulky materials such as masonry blocks on the chain drag model. Also featured in the booklet is a swivel wheel assembly available as optional equipment on the standard undercarriage. Optional gasoline or electric power, as well as size and specifications of the various conveyors ranging from 16 in. to 40 in. in width, are included in the material.

. . . Write No. 163

High speed highway mower

Brief but complete descriptions of the performance, construction and specifications of the Topeka 40-mile mower are embodied in a colorful brochure issued by the **Topeka Hiway Mower Inc.** The unit which provides mowing speed of 1 to 10 mi. per hour and travel speed up to 40 mi. per hour features heavy-duty construction, off-set engine and driver seat to help counter-balance side mounted mower, positioning of sickle through a 170-deg. arc and operation on steep slopes. Brochure also describes new reel-lever which provides individual braking of the driving wheel and enables the operator to apply all the power to one wheel to pull out of soft spots or mud holes, or to shorten the turning radius.

. . . Write No. 164

Brochure on versatile truck-mounted loader

P. B. Loader Manufacturing Co. has issued a 4-page folder describing its versatile truck-mounted loader. The folder includes action photos of the three models of Frost truck loaders. The booklet also shows a number of attachments and special shovels available including a special short blade projecting below the shovel lift which is used for cleaning out trenches in preparation for replacing black top. Complete data and dimensions on each model as well as recommended truck sizes are included.

. . . Write No. 165

Colorful brochure describes new AC motor scraper

A 20-page brochure printed in 4-colors has been issued by **Allis-Chalmers** on its new TF-360 motor scraper. Brochure describes the units double barreled hydraulic ejection system, double acting bowl jacks, and double acting hydraulic steering, high bowl clearance and 10-ft. apron openings, power train featuring constant mesh transmission, short turning radius, and durable operation. Included are complete specifications on the tractor and scraper as well as numerous full color photographs of the unit in operation.

. . . Write No. 166

Protective coating booklet

A new 14-page illustrated book describing its complete line of coal tar protective coatings has been issued by **Allied Chemical Corp.** Plastic and Coal Chemical Division. Primarily moisture barriers and impervious corrosion proofers, the coatings are particularly suitable for application on buried or immersed steel and concrete structures. The book lists detailed specifications, resistance properties, and typical uses for Allied's expanded coatings line, formerly marketed under the name Barrett.

. . . Write No. 167

Catalog on crane excavator

A 20-page catalog describing construction, components, operating features and job applications of the American 200 series crawler crane/excavator has been issued by **American Hoist & Derrick Co.** Catalog describes the operation of the unit rigged as a crane clamshell, drag line shovel, magnet crane, and back hoe. Parts and assemblies which make up the machine are pictured and described and numerous job photos are shown.

. . . Write No 168

Steel shoring equipment

A system of tubular steel shoring engineered to carry 20,000 lb. per panel (twice as much as conventional steel scaffolding) is described in a brochure published by the manufacturer, **Tubular Structures Corp.** of America. The "Hi-Load" shoring system consists of 4-ft. wide panels, adjustable staffs, shore heads and cross-braces. Panels are available in heights of 3, 4, 5, and 6 ft., along with a full line of accessories. The eight-page, two-color brochure describes in detail how the shores are erected and adjusted to solve various types of shoring problems. Included are numerous drawings, diagrams, job photos, and bracing details.

. . . Write No. 169

USED BY MEN WHO BUY EQUIPMENT FOR WHAT IT SAVES

The Vibrator that keeps costs calm

You don't have to get excited about costs when you use a Homelite High-Cycle Electric Concrete Vibrator. Only one man runs it, anywhere. Your labor costs less. And, there are more savings to gain. You need no special cradles or scaffolds. You set your Homelite Generator in any convenient spot within a 400' radius, and your man goes to work. Homelite's High-Cycle Vibrator handles 30 to 40 cubic yards of 2" slump concrete per hour. Works in tight spots or deepest forms without damage to tough kink-proof handling hose. Rugged, high-cycle motor in vibrator head cuts maintenance. Carryable, 143 pound Homelite Generator saves in many ways. Runs one or two vibrators and also operates 110 V. AC-DC electric tools and floodlights. Write for full information, now.

Homelite factory branches are located throughout the country. Your nearest one is as close as your phone. Call them or write for convincing demonstration or rapid service in any way.

HOMELITE
CARRYABLE
Concrete **VIBRATOR**
PUMPS • GENERATORS • BLOWERS • CHAIN SAWS

HOMELITE • A DIVISION OF TEXTRON INC., 9505 RIVERDALE AVE., PORT CHESTER, N. Y.
In Canada — Terry Machinery Co., Ltd.

Homelite Western Branches are in Washington — Seattle, Spokane; Oregon — Eugene, Portland; California — San Francisco, Sacramento, Los Angeles, Fresno; Utah — Salt Lake City; Colorado — Denver.

. . . for more details, write No. 78 on Reader Service Postcard

Handbook of transit mixer data

A 36-page book providing specifications on all major makes of transit mixers as well as complete data on Ford trucks used to carry mixers has been issued by the **Ford Motor Co.** The booklet covers types of mixer bodies, type of mixer drives, mixer weight distribution, facts on mixer body operations, truck mixer weight distribution charts, mixer body specifications, Ford tandem specifications data, Ford tandem chassis dimensions, as well as data on selection of Ford trucks for construction application and a description of the Ford industrial engine line. The booklet is printed in two colors, and illustrated with photos and drawings.

. . . Write No. 170

C-6 performance report on Western jobs

A report of Euclid C-6 tractor performance on typical Oregon construction and logging jobs has been issued by **Euclid Division of General Motors.** The booklet covers a series of demonstrations arranged by Interstate Tractor & Equipment Co. of Portland and includes photographs, case histories, and user reports. Profusely illustrated with photographs made on the job, the booklet covers such operations as pioneering and clearing, removing blast rock, bulldozing slides, on haul roads, bulldozing fill material, pushloading scrapers in deep mud, and numerous logging operations. The report covers a one year demonstration period.

. . . Write No. 171

Blasting caps safety poster

Safety posters warning against picking up or handling blasting caps have been issued by **Institute of Makers of Explosives,** 250 East 43rd St., New York 17, N. Y. Headed "Don't Touch Blasting Caps!" the poster shows two children caught in a explosion and includes pictures of various type of caps. The reverse side carries a discussion of blasting caps and their nature, explaining why they are dangerous, and lists instructions on what to do if you find a cap. Posters and other safety material are available through the Institute. The organization reports that 128 youngsters were injured in 1959 from blasting cap accidents and requests all explosives users to cooperate in its safety campaign. *. . . Write No. 172*

Custom lube units from standard components

Truck or skid mounted lube units for servicing construction fleets can be prepared from standard components to fit individual jobs through a series of diagram charts prepared by **Alemite Division of Stewart-Warner Corp.** Two skid-mounted and one truck-mounted portable service stations are covered by three separate 6-page brochures, each embodying a plan view diagram of the equipment layout. User may select any of several models and sizes of lube pumps, hose assemblies, reels, and other components which make up a portable service station. Price of each component going into the lube service unit is quoted separately. Entire cost of the unit can be adjusted to fit financial as well as service requirements. *. . . Write No. 173*

Small tandem rollers

Operating and construction features of Galion's 3- to 5-ton and 4- to 6-ton variable weight tandem rollers are fully described and illustrated in bulletin No. 435 from **The Galion Iron Works & Mfg. Co.** Also described is a pneumatic-tire towing attachment for the 3-5 ton size roller. Features of the torque converter drive as well as compression data and complete specifications are also given. . . ***Write No. 174***

Power tool catalog

Syntron Co. has published a 4-page catalog of portable construction tools. Included are specifications, data and illustrations of the complete line of Syntron electric hammers and hammer drills. The catalog also contains illustrations and information on self-contained gasoline hammer paving breakers, rock drills, concrete vibrators and vibrating floats. . . . ***Write No. 175***

Concrete forming booklet

A 12-page catalog describes design of **Economy Forms Corp.** steel forms for concrete construction. Illustrates simple designs and shows how forms are easily locked together. Booklet also pictures form set-ups for curved walls, tapered walls, tunnels, columns, corbels and offsets as well as simple walls. Complete specifications given for forms and accessories. . . . ***Write No. 176***

Trencher, backfill machine

A 6-page folder on a crawler-type trencher and backfill machine, the Davis T-66, has been issued by **Davis Mfg. Inc.** The new trencher features positive traction, hydraulic variable speed drive, instant forward and reverse, and effortless control of the trenching and backfilling operation. Performance, operation and construction are described in the bulletin.

. . . ***Write No. 177***

Insulating concrete bulletin

The use of Permalite expanded perlite insulating concrete in roof decks and floor fills is a subject of a bulletin issued by **Mineral Products Division of Great Lakes Carbon Corp.** It includes tables showing typical mix designs, physical properties and thermal conductivity of Permalite, as well as typical load test data for Permalite concrete roof decks at various spans. Complete specifications are also given. . . . ***Write No. 178***

1960 tamper catalog

A 3-color folder featuring the 1960 Jay Tampers is available from the **Jay Division of J. Leukard Machine Co.** It includes full specifications, and points out differences between the three Jay models in primary applications, plate sizes, tamping forces, travel speeds and resulting production. Photos feature major improvements in new models and 15 action pictures show the machines on typical jobs.

. . . ***Write No. 179***

Steel sheet piling

The advantages of renting sheet piling is discussed in a catalog from **L. B. Foster Co.** Typical pile arrangements for rectangular and circular cofferdams, and nominal lengths of straight walls and dimensions of pile cells are some of the topics covered. Special sections describe lightweight sheet piling, H-bearing pile, Foster rail pile, pipe pile and accessories.

. . . ***Write No. 180***

NEW EQUIPMENT

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

Simple seismic tool for earth exploration

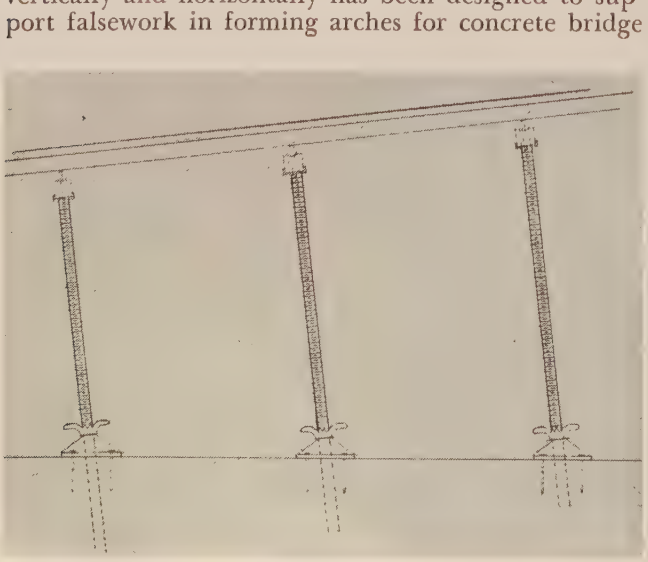
A small portable seismic timer has been introduced by **DynaMetric, Inc.** for exploration of subsurface conditions in shallow work. Applications for the new instrument include the investigation of foundation conditions prior to estimating highway jobs and for railroad and pipeline planning, as well as engineering

geology. No explosives are required and the impulse is started by striking a steel plate with a sledge as pictured. The instrument itself is self powered and completely portable. It is fully transistorized and measures time directly in milli-seconds, without converting. The principles of the machine and procedure are easily understood by any field engineer or geologist. Detailed instructions are furnished.

. . . Write No. 181

Jacks aid arch bridge construction

A new telescopic jack, which can be adjusted both vertically and horizontally has been designed to support falsework in forming arches for concrete bridge



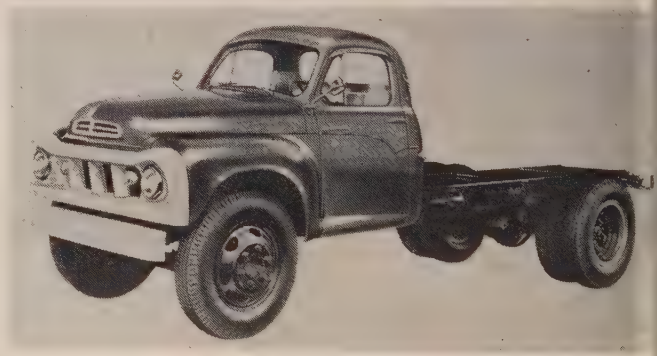
construction. Introduced by **William Form Engineering Corp.**, the units are designed to reduce excessive wood shoring, reduce wedging and an equal costly amount of stripping time. The jacks can be obtained in sizes up to 30 in. in height. They are 1½ in. in diameter.

Use of the jacks provides a high factor of safety, and they are adjustable to various beam depths. Vertical adjustment is made with a small wing-nut and Vibra-Lock brackets. Horizontal adjustment can be made with retracting round bars.

. . . Write No. 182

Studebaker trucks for reliability, economy

Time-proven qualities recognized for Studebaker trucks have been re-emphasized in the 1960 line. A series of medium, heavy-duty and four-wheel drive models identified by the name "Transtar" have been designed to meet all operating conditions and requirements for the construction industry within proper size and weight classifications. Two 4-wheel drive models



of one-ton capacity are included in the new line, one powered by 6-cylinder engine, and the other by a V-8 power plant. These models offer the economy of two-wheel drive on the highway, with the extra four-wheel traction in reserve for rough or steep going. Four models are available in the heavy-duty, two-ton series with wheel base ranging from 131 to 190 in., the latter chassis to accommodate an 18-ft. body Transtar transmissions are 4-speed, synchromesh on all models.

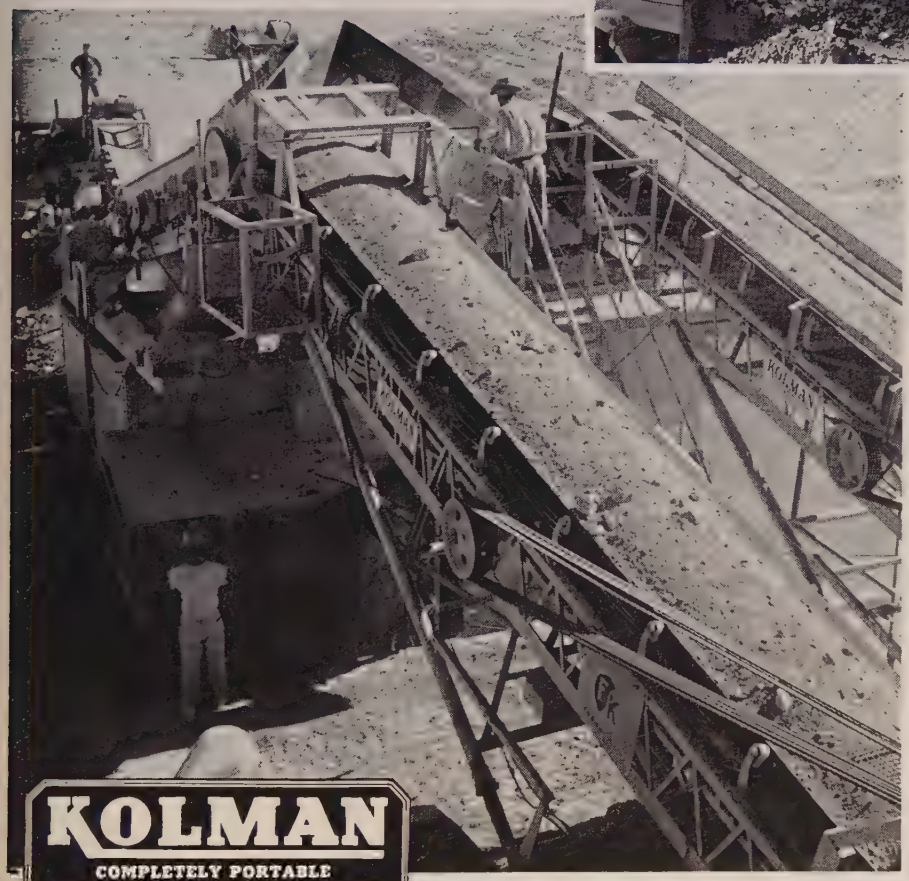
. . . Write No. 183

Balderson's new angledozer that tilts

Designed to fit on Caterpillar's No. 994 Traxcavator, **Balderson, Inc.** announces a new angledozer with hydraulic tilt control. Designated BA944, the unit will increase the usefulness of this latest wheel-type loader. It mounts on the lift arms of the loader in place of the bucket. When used in a straight position, the extension brace folds in behind the blade. Hydraulic pitch control, when used as a straight dozer, is obtained by actuating the bucket dump cylinders. The

Fredericksen & Kasler Lick Thin Margin on Freeway Job with Two KOLMANs

Dozers and scrapers charge the dump hopper for the twin KOLMANs.



As these two 60'x42" KOLMANs with 12'x60" screens set the pace, 25-ton trucks pull out from under the bunkers in 15 to 18 seconds.

Twin 60' x 42" KOLMANs Peak at 2000 tons per hour

Fredericksen & Kasler, California contractors, really sharpened their pencils to bid for a 29½-mile section of four-lane divided highway near Victorville, Calif., the longest contract the state of California has ever awarded. Their $5½ million bid left $950,000 "on the table" over their nearest competitor, and for awhile the margin appeared disastrous.

Only by coming up with imaginative methods to handle the astronomical quantities of material did Fredericksen & Kasler lick the job. There were 3½ million cubic yards of grading, over half a million tons of base course material production, and 250,000 tons of aggregate production for plant-mix paving.

Among their innovations was the use of two KOLMAN Model 101 Portable Conveyor-Screen Plants at the pit, placed side by side. By dumping each unit over its individual bunker, twin dumping points were developed for faster truck loading. KOLMAN feeders at the dump hopper were unprotected by manual gates. Everything from 8" rock on down was put through as fast as the system would take it — up to 2000 tons per hour!

Thus another contracting firm turned potential loss into profit by stepping up loading and screening production with KOLMANs, the original portable conveyor-screen plants.

SEE YOUR NEAREST DEALER

ARIZONA
PHOENIX—Arizona Cedar Rapids Co.

CALIFORNIA
LOS ANGELES, BAKERSFIELD, SAN DIEGO, RIVERSIDE, SANTA BARBARA — Brown-Bevis Industrial Equip. Co.
OAKLAND—Spears-Wells Machinery Co.

COLORADO
DENVER—Faris-Moritz Equipment Co.

IDAHO
BOISE, POCATELLO—Intermountain Equip. Co.

MONTANA
BILLINGS, GREAT FALLS, MISSOULA—Miller Machinery Co.

NEVADA
LAS VEGAS—Clark County Wholesale Mercantile Co.

OREGON
PORTLAND—Balzer Machinery Co.

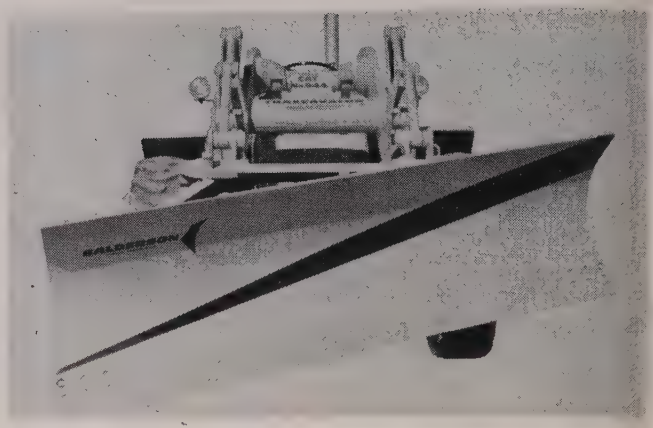
UTAH
SALT LAKE—Rasmussen Equipment & Supply Co.

WASHINGTON
SEATTLE—Sahlberg Equip., Inc.
SPOKANE—Intermountain Equip. Co.

WYOMING
CHEYENNE, CASPER, ROCK SPRINGS and SHERIDAN—Wortham Machinery Co.

KOLMAN MANUFACTURING COMPANY
5670 West 12th St. Sioux Falls, S. D.

. . . for more details, write No. 81 on Reader Service Postcard



blade measures 35 in. high and is 10 ft. 2 in. long. When angled either right or left at 25 deg., it cuts a 9-ft. 2-in. path. *. . . Write No. 184*

Power applied to every working member

Designated "power" graders because controlled power is applied to every working member, **Austin-Western** is producing a new series, the Pacer-400 and the Super-400. Announced many months ago, production was delayed by the steel strike and detailed information is only now available. Both machines have 140-hp. engines and both are in the 30,000-lb. class, making them real heavy-weights. The 6-wheel Super-400 (see picture) as well as the 4-wheel Pacer-400 has

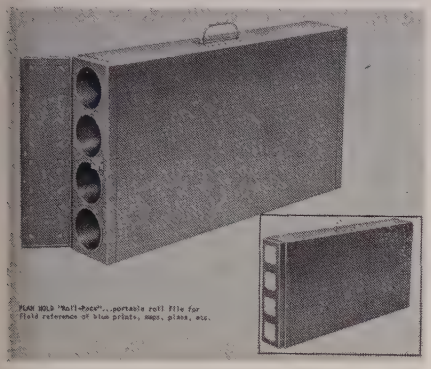
power applied in the following places: Power drive at all wheels, power steering at front and rear, power blade controls, power attachments, power transmission, power shift, and power reverse. The all-wheel drive provides traction ahead of the blade as well as behind it, and the power steering front and rear allows the machine to be used in tight places. The purchasers may choose between GMC or Cummins diesel engines, both of 143 hp. *. . . Write No. 185*

Ateco rock ripper for the TD25

Designed especially to perform with the International TD25, a heavier duty rock ripper is now available from **American Tractor Equipment Corp.** A feature of this ripper (Model HR48) is the offset tool beam with provides ample clearance for mounting the ripper on tractors that are equipped with rear-mounted power controlled winches. Extensive use is made of alloy and heat-treated steels to increase the ruggedness of the ripper. Maximum ripping is 48 in. with standard shanks. The rippers are designed to balance perfectly dozer weight for increased traction. *. . . Write No. 186*

Steel carrying case holds rolled plans

An 8-lb. steel carrying case which holds 4 sets of rolled plans is introduced by **Plan Hold Corp.** The rectangular case holds 4 steel tubes of 2⅝-in. diameter behind a spring-latched door at the end. Label



cards can be inserted in the face of the door indicating which plans are stored in each tube. Unit can be used for transporting plans and drawings or the field file. Available in 23½ and 30-in. lengths, the units are 4½ in. wide and 12 in. high. *. . . Write No. 187*

New model cranes feature improved clutches

Major design changes in the 1960 model **Hanson** excavators and cranes of ⅜, ½, and ¾ cu. yd. capacities include improved clutches, torque booster control bands, and drum brakes. The new clutch band is easier to engage, simpler to adjust, and transmits more power. Drum brake bands and controls are completely redesigned for simplification to decrease linkage and improve "feel" of the load. Operator comfort is increased with new suspended push-type pedals and an upholstered adjustable seat with cushioned back-rest. Hanson cranes are available with crawler or truck mounting.

. . . Write No. 188

1960 power buggy

Greater stability is featured in the 1960 model power buggy manufactured by **Aeroil Products Co., Inc.** Wheel base has been moved forward to provide better balance. The 4-wheel 1,500 lb. capacity buggies also feature a deadman brake

which automatically brings the unit to a complete stop when the operator releases the right hand lever. An engine guard around the air cleaner, a new improved aircraft type clutch cable, and forward and reverse transmission with hand shift lever are standard equipment. The buggy is powered by a 7-hp. gas engine. Units are available with standard 10 cu. ft. concrete bucket or flat-pallet for hauling materials. Overall width is 31 in. and loading height is 37 in.

. . . Write No. 189

Efficient roller for small jobs

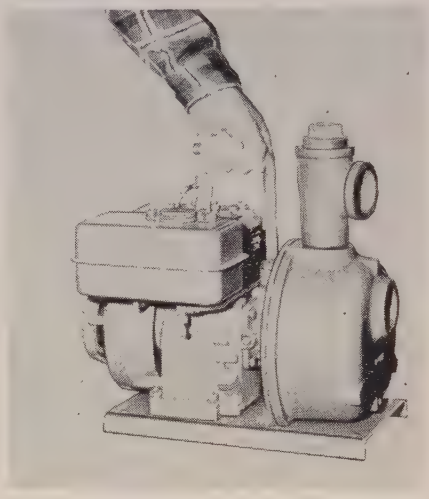
A small articulated roller whose two rolls track perfectly in turns has been developed by Holt for highway patching and parking area compaction. The **Holt** 3-ADH roller is a fully automatic driven and controlled machine in the 3-ton weight class. Its hydraulic centerpoint steering prevents overlapping as each roller follows directly be-

hind the other, even on short turns. The 12½-hp. electrically started engine delivers an even flow of power through the Holt 2-speed hydro-drive making for greater ease of operation and longer life. An auxiliary edge roller for work close to curbs and walls is available. The new model is one of five rollers manufactured by the company. All five are portable and trailers to fit each model are available.

. . . Write No. 190

Line of lightweight pumps

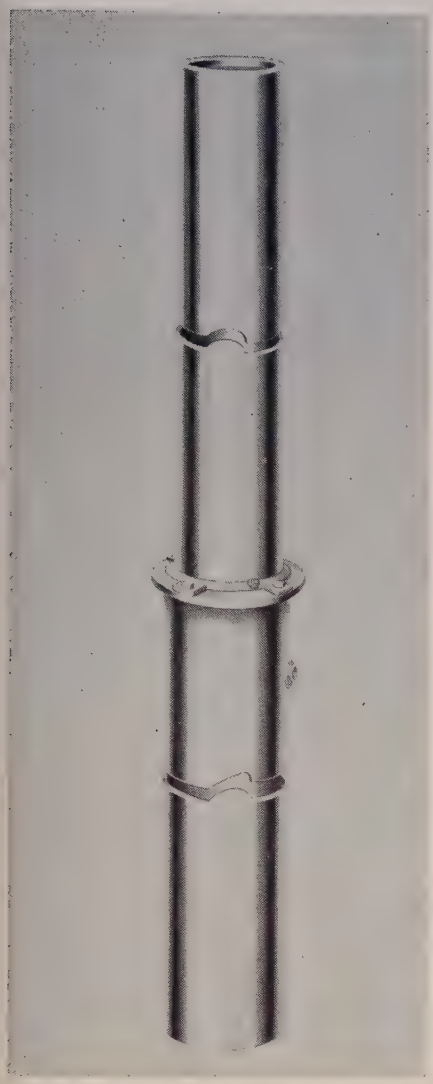
A line of lightweight pumps with cast iron impeller and volute combined with lightweight aluminum pump body and engine has been introduced by **Construction Machinery Co.** Named "CMC Wonderlites," the pumps feature simplified construction and fewer moving parts. Four models are available ranging in size from 1½ to 3 in. They are powered by 4-cycle all-aluminum Briggs & Stratton engines. Largest of the models, the 3-in. size, weighs 97 lb. and will pump 19,000 gal. of water per hour. Built either for suction lift or booster pumping, the units will prime automatically on suction lift up to 25 ft. The company also manufactures a complete line of contractor's pumps from 1½ to 10-in. sizes as well as diaphragm pumps, hi-pressure pumps, and jetting pumps.



. . . Write No. 191

Custom made hydraulic cylinders

A new line of single-acting hydraulic cylinders ranging from 4 to 18 in. in diameter with capacities up to 75,000 lb. is introduced by **Joyce-Cridland Co.** The custom made units will be manufactured in lengths to suit the customer. They feature high horizontal stability with cylinders available in operating pressures up to 500 psi. Hydraulic piston moves on remov-



able precision bronze bearings. A top bolt ring for attachment to the working surface is standard equipment. Tank, pump, and controls to make a complete hydraulic system are also available.

. . . Write No. 192

Tireless tire can't go flat

A solid tire made of laminated rubber and fabric wedges which is both puncture proof and smooth riding is marketed by **Notat Tire Co.** The Notat tires which are made for trucks, loaders, tractors, and

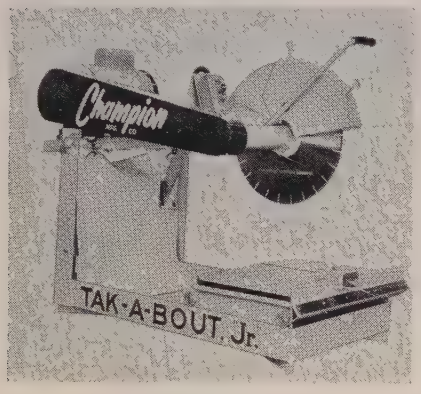
similar equipment are unaffected by sharp bricks, rocks, nails, glass, scrap iron, steel chips, and other puncture hazards. The tire's resiliency gives a smooth ride, absorbs loads and minimizes jarring. Tires have good traction and braking characteristics on wet or icy surfaces.

. . . Write No. 193

Portable masonry saw

A portable masonry saw unit which fits in the back of a station wagon and can be used on a work bench scaffold or wherever needed is announced by **Champion Manufacturing Co.** Called Tak-A-Bout "Jr," the saw is available with a 1 or 1½-hp. fan-cooled motor and has a 14-in. blade guard capacity, self priming pump, diamond lock, and a removable mandrel. Both wet and dry cutting models are available. The unit can use abrasive or diamond blades.

. . . Write No. 194



Push-button controls for transit trucks

Push-button operation of hydraulic controls for ready-mix trucks is now available as optional equipment from **Monarch Road Machinery Co.** The push-button gives instant control in raising and lowering the truck discharge chute. Chute automatically holds any position, until changed by pressing the button. Using the push-button switches, more than one control station can be located on the truck.

. . . Write No. 195

Light weight power plant

A 2,500-watt generator designed to provide electric power for 180-cycle concrete vibrators and other

tools is announced by **Wincharger Corp.** Winco's 180 cycle unit provides 2,500 watts of 180 cycle, 3-phase, 230 volts a.c. power, or 1,500 watts of 110 volts d.c. power. They employ 4-cycle Briggs Stratton engines. A new heavy-duty two-wheel dolly with fully pneumatic tires also is available.

. . . Write No. 196

Rubber tired crane features one-man operation

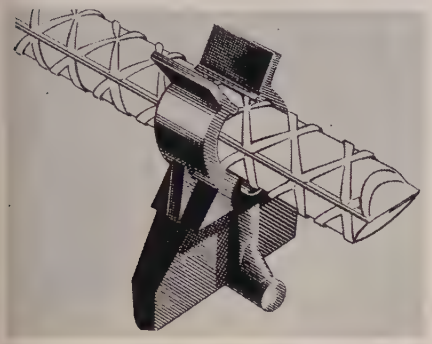
An improved Model 357 self-propelled, rubber tired mobile crane is announced by **Unit Crane & Shovel Corp.** Rated at 15-ton capacity, the new model is mounted on a two-axle carrier with dual tires at the rear. All functions, crane operations, and transport are controlled from a single full vision cab. Features include pendant type boom rigging as standard equipment, 2-pin adjustable double telescopic outriggers, full-time hydraulic power steering, and heavy-

duty construction throughout. Split drum construction eliminates costly dismantling of the assemblies since shaft and bearings remain in place. The machine has a 2-speed, air-operated transmission for high speed travel and a short turning radius which is especially valuable for work in restricted sites. Literature available.

. . . Write No. 197

Polyethelene rebar supports

Small polyethelene legs with slotted sleeve which securely grip reinforcing steel and hold it in position at the proper height above the bottom of the slab have been introduced under the brand name of P-Kay Slab Bolsters by **Universal Builders Supply Co., Inc.** The light-



weight rustless supports are available in heights from ½ to 1½ in. and will hold a No. 3 to a No. 9 bar. They are easily attached by pressing the bar down through the "V" shaped slot at the top of the open sleeve. Once the bar is seated in the sleeve, the sides spring back to grip it securely.

. . . Write No. 198

Comfortable hard hats

Safety hats and caps of aluminum fiberglass or plastic with contour fitting head bands are announced by **Bausch & Lomb.** The

WHERE TO BUY GORMAN RUPP Pumps for Contractors

These distributors offer the full line of Gorman-Rupp Contractors' Pumps. Most have rental service, too.

Andrews and Andrews Equipment
Portland, Oregon
Andrews Equipment Service of Washington
Spokane, Washington
Brown-Bevis Industrial Equipment Co.
Bakersfield, California
Cook Bros. Truck & Equipment Co.
Oakland, California
The Cornelius Co.
Albuquerque, New Mexico
Cornelius Equipment Co.
Farmington, New Mexico
Delta Tractor Co.
Stockton, California
Paul Droscher Sales
Redding, California
Faris-Moritz Equipment Co.
Denver, Colorado
Industrial Tractor Sales
North Sacramento, California
Lang Construction Equipment Co.
Idaho Falls, Boise, Idaho
Loggers & Mill Supply Co.
Arcata, California
Mid-State Truck & Machinery Co.
Wenatchee, Yakima, Washington
Pacific Hoist & Derrick Co.
Seattle, Washington
Reno Equipment Sales Co.
Reno, Nevada
Shasta Truck & Equipment Sales
Redding, California
Smith Machinery Co.
Salt Lake City, Utah
Studer Tractor & Equipment Co.
Casper, Wyoming
Western Construction Equipment Co.
Billings, Great Falls, Montana
Western Equipment Co.
Eugene, Portland, Oregon
West Main Pump Sales & Service
El Centro, California

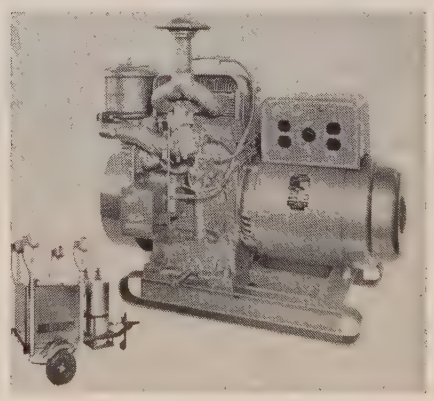
. . . for more details, write No. 88

caps feature a contour-fit suspension with a unique design of pliable polyethylene. The hats conform to the head giving "soft-hat" comfort without top-heavy feeling. Lock straps assure minimum crown clearance of 1¼ in. which can be increased, if necessary. Hats will fit any head size from 6⅝ to 8. Suspension can be left intact for cleaning and sterilization, but can easily be removed for replacement. Plastic-zippered sweat band can be taken out and replaced without affecting suspension. Fiberglass hats are available in 8 colors. Aluminum hats are anodized in a natural aluminum color. The electrical plastic hats are made of linear polyethylene which assures complete insulating safety. The shell features uniform strength, and any damage is instantly visible. It is available in standard yellow.

. . . Write No. 199

Heavy-duty generator sets

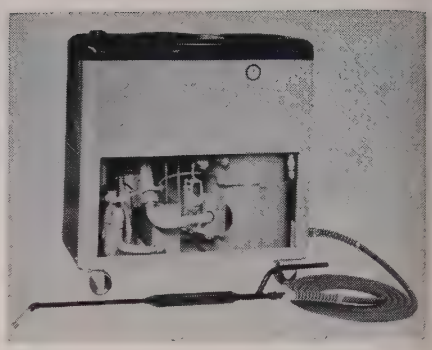
A line of 7,500-watt Winco engine generators is announced by **Wincharger Corp.** The units deliver 15% more power at a price near that of the standard 5,000-watt generator. They feature an exclusive idling control that saves up to 60% in fuel cost, as well as extend-



ing engine life and lowering maintenance cost. Generators are available with skid mounting or on the new Universal trailer, also introduced by the company. This two-wheel highway trailer is adaptable to a wide range of generator capacities and available with fuel tank mounting and light stands. Literature available. *. . . Write No. 200*

High capacity steam cleaner

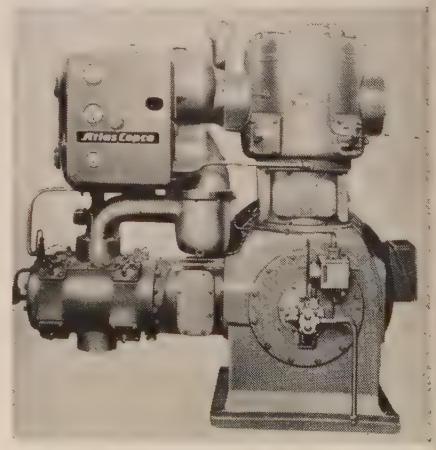
A compact self contained steam cleaning unit which delivers 130 gal. of hot solution hourly is announced by **Malsbary Manufactur-**



ing Co. The Model 130 features a newly designed orifice and nozzle which increases cleaning efficiency 20%. The unit is oil-fired, caster-mounted and weighs 565 lb. Its dimensions are 45 in. long, 21 in. wide, by 43 in. high. Price delivered in USA is $845 which is comparable with 120 gal. capacity machines. Tricycle and trailer mounts are available at extra cost and a gas-fired stationary model is also available. Literature and specifications offered. *. . . Write No. 201*

High pressure compressors

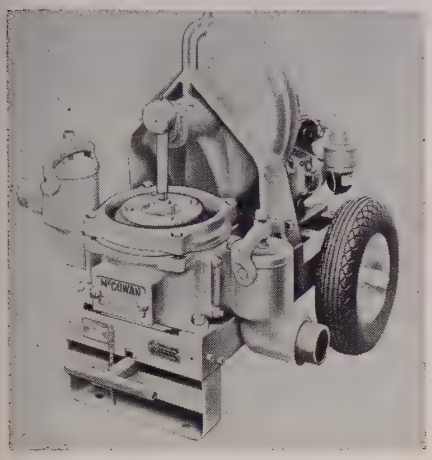
Atlas Copco Pacific has introduced a line of high pressure air compressors with output ranging up to 498 cfm. at 225 psi. The machines incorporate the basic crosshead design employed in standard AR-type compressors. This design is especially suited for high pressure compression operation because the crosshead shoes rather than the



pistons absorb the large lateral stresses which develop in high pressure compressors. The line includes three models, the AR-416 which delivers 498 cfm. at 225 psi., the AR-316 which produces 382 cfm. at 225 psi., and the AR-116 which has an output of 183 cfm. at 225 psi. Weight ranges from 6,100 lb. for the largest model down to 2,640 for the smallest. *. . . Write No. 202*

Diaphragm pump handles sludge

A new neoprene ball valve and replaceable seat are featured in the line of industrial diaphragm pumps announced by **McGowan Pumps, Division of Leyman Manufacturing Corp.** The units are designed to



handle sludge and heavy, lumpy liquids which normally clog other pumps. Capacities range from 3,000 to 6,000 gph. and the pumps are available in 3-in. or 4-in. sizes in a wide range of options. These include electric motor or engine drive, base mounting or wheel mounting on steel wheels or pneumatic tires.

. . . Write No. 203

Portable hydraulic rams

Power to apply from 10 to 100 tons of force in any direction is supplied by a line of heavy-duty hydraulic rams and independent pumps introduced by **Duff-Norton Co.** The Ram-Pac line includes 5 pumps using various power sources. Two are hand operated, one air, one electric, and one gasoline-powered. Rams can be used for heavy moving, lifting, pushing, pulling, adjusting, testing, and bending, as well as in permanent installations in hydraulic jobs, fixtures or presses. Attachment units and accessories complete the line.

. . . Write No. 204

Double flange vibrating screed

A single beam double flange vibrating screed for striking off narrow slabs such as sidewalks and prestressed concrete beams is announced by **Stow Mfg. Co.** A vibrating unit driven by a 1-hp. electric motor or 3-hp. gasoline engine transmits the vibration evenly to

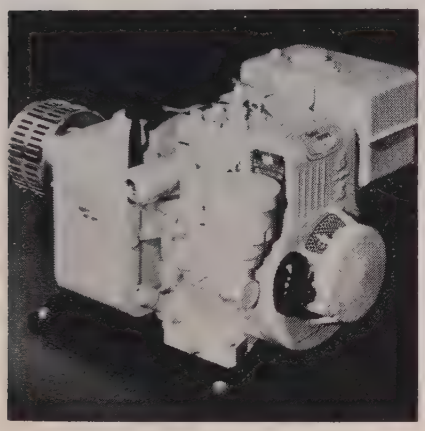
two 3-in. wide steel screeding flanges. Action with the two flanges is like making two passes at once. The first flange strikes off the concrete, and the second one removes any air bubbles, leaving a smooth surface. The screed which weighs only 145 lb. for a 4-ft. length features adjustment of vibration amplitude by a dial control. Amplitude adjustment is made by turning an eccentric on its axis, using a dial to adjust to any point from low to high and locking the eccentric in position with set screws. Vibration propels the screed, while the operators guide it. Unit includes scrapers to keep concrete off the forms.

. . . Write No. 205

Self priming pump weighs only 42 pounds

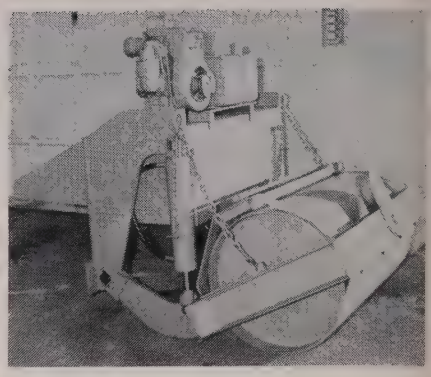
Two models of centrifugal self-priming pumps which feature weight saving aluminum bodies are announced by **Pacific Mercury.** The Model 5M, a 1½-in. pump, has a capacity of 5,000 gph. and weighs only 42 lb. The Model 7M with 2-in. suction and discharge has a 7,000-gph., capacity. Both models have 4-cycle engines with automatic recoil starter, oil bath, air cleaner, suction strainer, shock-absorbing rubber mounts, carrying handle, replaceable wear plant and replaceable iron volute with a patented impeller design that keeps the seal free of debris and dirt. Simplicity of the patented design eliminates check valve and peeler, reduces wearing parts to a minimum and cuts cost of replacement parts.

. . . Write No. 206



Steel roller for motor grader

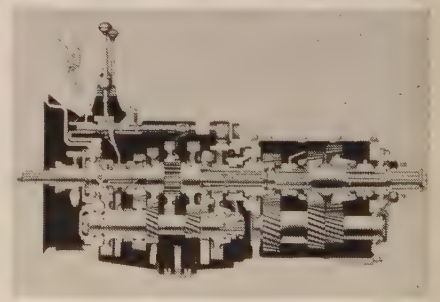
A 42-in. steel roller attachment containing its own hydraulic power system which can be attached to back end of most makes of motor graders is announced by the **Martin Co.** The new model GR-42HG features an independent gasoline engine driven hydraulic pump which enables it to operate independently of the grader's hydraulic system. The unit consists of a frame with 3-point mounting which fits on the back of the grader and a hinged yoke holding the roller. The yoke is raised and lowered with a hydraulic cylinder mounted on each side. In operation the Martin Graderoller uses the weight of the grader to exert up to 225 lb. of compaction per linear inch on the roller. Components include a 7-hp. single-cylinder Wisconsin engine, Barnes direct-connected hydraulic rotary gear pump, and a 35-gal. automatic sprinkling system to keep the roller free from sticking asphalt. The unit weighs 2,000 lb.



. . . Write No. 207

15-speed transmissions for diesel trucks

Fuller Mfg. Co. has announced two heavy-duty 15-speed transmissions for use in diesel powered trucks and tractors of the 1,120-cu. in. class. The new models 15-G-1120 and 15-H-1120 are designed especially for combination on and off-highway applications. The units feature extremely short installation dimension making possible shorter wheelbase, maximum operation flexibility with 10 gear splits and 5 additional speeds available through a deep reduction in the auxiliary, a wide choice of gear ratios, and reduced weight obtained by elimination of support brackets, joints, cross members and a propeller shaft. The two units differ only in ratios of the auxiliary section.



. . . Write No. 208

Light trencher size increased

A larger, heavier model of the Bus Brown trencher is announced by **Brown Mfg. Co.** The new model weighs 350 lb. more and offers greater trenching widths than its predecessor. The Model 468R has variable speeds up to 12 ft. per minute and will dig trenches up to 12 in. wide. Features include 4-wheel drive powered by 12-hp. Wisconsin engine, and a hydraulically

controlled digging boom that can be raised to an upright position. The 1,100-lb. unit drives on all 4 wheels while digging, on the rear wheels in transport gear, and balances on the front wheels for steering. It is recommended for digging water and gas lines, underground electrical wiring, lawn sprinkling systems, underground telephone cables, and laying out limits for excavation. . . . *Write No. 209*

600-cfm. compressor mounts on tractor

A portable rotary compressor unit of 600-cfm. capacity has been developed by **Joy Mfg. Co.** for mounting on the rear of a tractor. Called the Airvane RT-600, the unit is driven through a rear power take-off. It can be teamed with a Joy rock drill mounted on the same tractor. The unit is available as a complete package including a Joy designed power take-off. Literature available. . . . *Write No. 210*

Scraper size increased

Capacity of the **Caterpillar** No. 435 four-wheel scraper has been increased by 14% in the series D model to 15 cu. yd. struck and 19 cu. yd. heaped. Other features of the series D model are greater flotation with 20.5 x 25 front tires and 26.5 x 25 rear tires, stronger construction including thicker draft arm plates, stronger spreader tube and stronger gooseneck. Ejector height and clearance has been increased and higher strength steel used in the pole and axle. Pole is redesigned to permit greater height and increase in capacity.

. . . *Write No. 211*

News of DISTRIBUTORS

Diamond T announces dealers

Diamond T Motor Truck Co. announces three additional dealers in the West. All three are actively merchandising Diamond T trucks in conventional models as well as tilt-cabs, and all have a comprehensive stock of replacement parts. They are: V & E Equipment Co., Casper, Wyo.; C. L. Tyrrell, Inc., Sterling, Colo.; and Bair's, Inc., Idaho Falls, Idaho.

Wood Tractor named by Parsons

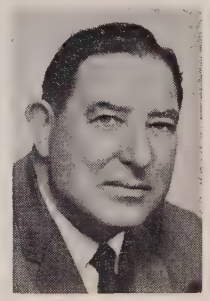
Wood Tractor Co., Portland, Ore., has been appointed distributor by the Parsons Company, division of Koehring Company. Wood will sell and service the complete line of Parsons ladder and wheel-type trenchers. Territory assigned to the new distributor includes all of Oregon except Malheur County, and includes five counties in southern Washington.

Honors for Westerners

Four Western distributors received awards for outstanding contributions to the construction industry from the U. S. Chamber of Commerce recently. They were among seven prominent equipment distributors so honored at the National Construction Industry Conference in Washington, D. C. The Westerners are: A. F. Sersanous, president of Loggers & Contractors Machinery Co., Portland, Ore.; A. F. Garlinghouse, chairman of the board of Garlinghouse, Fremon & Co., Los Angeles; R. L. Arnold, president of Arnold Machinery Co., Inc., Salt Lake City, Utah; and J. W. How, general partner of Edward R. Bacon Co., San Francisco.

Mayer at helm of AED

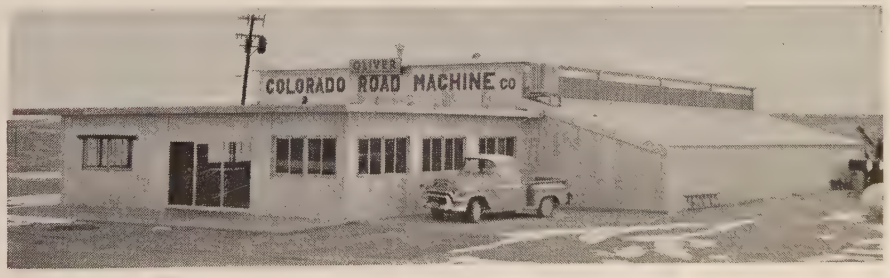
Herbert J. Mayer, the new president of Associated Equipment Distributors, brings to this executive post an experience of extensive AED activity. He served as vice president in 1959 and as director of Region 11 in 1958. Besides he had been a member of various committees. In 1953 he was elected president of the Construction Equipment Distributors of Northern California. His elevation to the presidency of AED followed the untimely death of Jewel A. Benson. Mayer is executive vice president of Western Machinery Co. and general manager of Edward R. Bacon Co., both located in San Francisco



Herbert J. Mayer

May is used-equipment month

Caterpillar dealers will be featuring used equipment values throughout the month of May according to



APPOINTED by Wacker Corporation to handle its rammer line in the southeast section of Colorado is Colorado Road Machine Co., 4100 North Freeway, Pueblo. The new distributorship is headed by *Myles Nelson*, general manager. Service manager is *Les Bewley*, while *Gene Spear* is parts manager.

announcement by W. S. Zeigler, domestic sales manager for Caterpillar Tractor Co. During the special month bargains in all condition categories from Bonded Buy to "as is" will be available. All machinery users can benefit, from the man not in a position to purchase new and those needing additional machinery for short-term, to the man who always buys new and has older machines to turn back in trade.

Jim Kinkead elevated by A. H. Cox

Announcement is made that J. R. Kinkead has been elected vice president of A. H. Cox & Co., Seattle, Wash., and appointed manager of the Rental Machinery Co., a subsidiary. He has been with the Cox

Jim Kinkead

organization since 1937 with the exception of three and a half years spent in the armed service. In 1947 he was transferred to the sales department of the Rental company, and later promoted to assistant manager.

Cleaver-Brooks Hawaiian distribution

Added to the lines distributed in Hawaii by Foster Equipment Co. of Honolulu is the fire tube and water tube boilers, and water distillation equipment manufactured by Cleaver-Brooks Co. Foster's president, Fred W. Cordes, recently toured the Mainland, visiting some of the firm's key accounts.

Dealers get full information on Standard plants

Standard Steel Corp.'s Road Machinery Division distributors from all parts of the United States and Canada recently attended Standard's annual sales meeting at Palm Springs, Calif. Western distributors in attendance included: Hil Bergland, Washington Machinery Co., Seattle; Ben Banks and Fred B. Evans, Archer Tractor & Machinery Co., Salt Lake City, Utah; George Martin and W. O. Wallinder, Mountain Tractor Co., Missoula, Mont.; Harold Morgan, McCormick-Morgan Machinery Co., San Francisco; Charles Moritz, Faris-Moritz Equipment Co., Denver, Colo., and Carson Ribble, N. C. Ribble Co., Albuquerque, N. Mex. A highlight of the meeting was a field trip to inspect a Standard RM 4,000-lb. batch capacity plant in operation at Salton Sea.

Pavement sealer distribution in Utah and Nevada

Appointment of Utah Emulsions Co., Salt Lake City, as a factory franchised distributor of Jennite J-16 and Vynatex 23 asphalt pavement sealers is announced by Maintenance, Inc. The distributor's territory includes the states of Utah and Nevada.

New Massey-Ferguson dealer

Massey-Ferguson Industrial Division announces appointment of Garden Equipment Co., Concord, Calif., as an area dealer to handle M-F industrial equipment including tractor shovels, industrial tractors, tractor-mounted backhoes, loaders and other power matched attachments.

Service manager named for southern Oregon

Al Vice has been named general parts and service manager for Crater Lake Machinery Co., Caterpillar dealer for southern Oregon

Al Vice

and northern California. He will make his headquarters at Medford, Ore. Vice has been associated with the heavy equipment business for more than eighteen years.

Clark Rental appoints dealers

Announcement is made of the appointment of four new dealers for Clark Rental Corp., subsidiary of Clark Equipment Co. Through the rental system the following companies are offering long and

short term rental contracts for the Clark line of fork-lift trucks and other materials handling equipment in their respective areas: Robert H. Braun Co., Pico-Rivera (Los Angeles); Gray Lift, Inc., Fresno; Lifton, Inc., Oakland, Calif.; and Liftco, Inc., Seattle, Wash. The four firms continue to be the franchised dealers for sales and service of the Clark line.

Saber announces distributorships

New distributors for Saber Tooth Co. of Oakland, Calif. are announced: In Arizona: Tractor Parts & Supply, Inc., Phoenix; New Mexico: Contractors' Equipment & Supply Co., Albuquerque; Texas: Haag Tractor Co., El Paso.

MANUFACTURERS

Fairbanks Morse adds to manufacturing facilities

Fairbanks, Morse & Co. has completed negotiations with Gilmore Steel Corp. for fabricating facilities at Oakland, Calif., for the manufacture of fabricated all steel scales for construction and industry. Clyde Marion, a pioneer in development and design of this type of weighing equipment, will be in charge of manufacturing. He will headquarter in San Francisco. R. T. Bartlett will serve as chief engineer of the Oakland operation.

Developed under the direction of Roger M. Murray, vice president and Western regional manager, this new plant will be under the direct supervision of F. C. Johnson, vice president and general manager of the Scale Division, Fair Lawn, N. J. With this additional facility, FM&CO now operates four plants manufacturing more than 100 types of scales, among them truck, hopper, railroad track, portable, etc.

Peerless Pump names Walt Blair to new post

Appointment of Walter J. Blair as vertical pump product sales manager, Peerless Pump, Hydrodynamics Division, Food Machinery & Chemical Corp., Los Angeles, is announced by G. F. Twist, FMC vice president and Division manager. For the past several years he has been product sales manager of the process line of pumps. In his new post, Blair will be in charge of planning and supervising the sales activities for the complete line of vertical pumps.

Beatty Scaffold sold

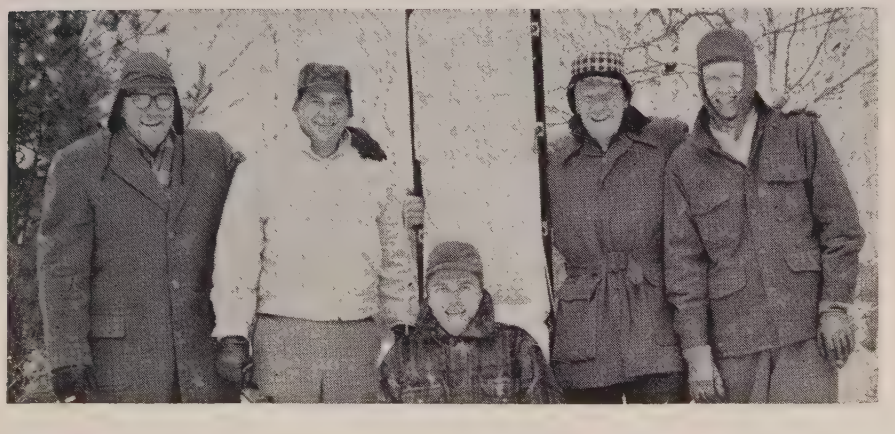
D. E. Beatty, president of Beatty Scaffold, Inc., San Francisco, announces that the Beatty Scaffold organization has disposed of the physical assets to Safway Steel Products Inc., Milwaukee, the company he originally founded in 1936. The new organization will operate as a division of Safway Steel Products, with head offices in San Francisco. Beatty will act as a consultant to the new division. The operating distributor organization built up by Beatty Scaffold will remain in effect throughout the eleven Western states, including Hawaii and Alaska.

C.I.T. adds to sales staff

Howard E. Rummel has been added to the sales staff of C.I.T. Corporation, Seattle industrial financing company. He will headquarter in Yakima, and will cover the central Washington area including Wenatchee, Pasco, Kennewick, and Walla Walla.

DROTT DEMONSTRATES LINE IN WINTER SHOW

THE DROTT Tomahawk Proving Grounds in northern Wisconsin was the site of a winter demonstration and sales meeting with officials and territorial managers of International Harvester and Drott Manufacturing Corp. sales personnel. Purpose of the meeting was to better acquaint all present with the latest improvements in the International Drott Skid-Shovel line, and to see the equipment at work under adverse conditions. The Four-in-One demonstration got under way with the introduction of a family of six, complete with "Bitin' Buckets."



DROTT hospitality was much in evidence. In between the "working" and sales sessions the men indulged in a bit of ice fishing and tobogganing, too. Pictured here are Western toboggan champions after having established a new distance record. From left to right: *Howard Barrand, Jim King, Ed Rixman, Art Lange* and *John Reishus.*

Cravens is new Euclid district rep

Appointment of John A. Cravens as district representative in four Western states to succeed Olin A. Lee is announced. Lee has been named manager of another Euclid branch. Cravens will move to Denver from the headquarters in Cleveland. His territory comprises the states of Wyoming, Colorado, New Mexico and Arizona.

GM Diesel promotes Gerald Holly

Gerald R. Holly has been named manager of sales engineering for the Detroit Diesel Engine Division of General Motors Corp. He has been general supervisor of specifications and price analysis since 1959. Prior to that he was zone sales manager working out of the company's San Francisco regional office.

Rucker appoints

New organizational appointments are announced by The Rucker Company, Oakland, Calif. Howard C. Zintz, formerly chief engineer was promoted to the position of director of engineering. He has been with the company since 1954. D. J. Bentley was appointed plant manager, a newly created position, having complete responsibility for engineering and manufacturing operations. Albert B. Roth, formerly assistant chief engineer, was promoted to chief engineer.

Chicago Pneumatic moves S.F. branch

A new branch headquarters building for Chicago Pneumatic Tool Co. has been completed and occupied at 145 Mitchell Ave. in Utah Construction & Mining Co.'s South San Francisco Industrial Park. The new structure will provide sales, service and warehouse facilities for the firm's operations in Northern California and west Nevada which have been located in the Bay Area for nearly sixty years.

Paul Isaacson rejoins Young Iron

Paul Isaacson, formerly associated with Young Iron Works, has rejoined the firm after an absence of six years spent in developing Columbia Tractor Co. in Wenatchee, Wash., in cooperation with his brother Ted Isaacson. As an executive of Young Iron Works for 30 years, Isaacson is well known in the Northwest. Young Iron Works has plants in both Seattle, Wash., and in Eugene, Ore.

C. R. Clark retires from Tidewater

Charles R. Clark, veteran Tidewater Oil Co. marketing executive in the Bay Area, is retiring from the company after more than 40 years of service. Clark has headed the petroleum firm's sales operations in Northern California before accepting a special assignment in the Western division earlier this year.

Bay City Shovel becomes Utah subsidiary

A. R. Corbett, vice president of Unit Crane & Shovel Corp., Milwaukee, Wis., announces the purchase by Unit of all stock holdings of Bay City Shovel, Inc. of Bay City, Mich., which will function as a wholly-owned subsidiary of Unit.

Caterpillar guarantees rebuilt assemblies

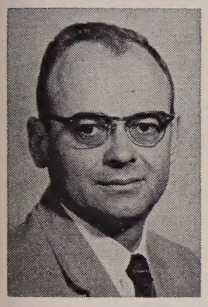
Guaranteed rebuilt parts assemblies are now available from Caterpillar dealers under a "Bonded Buy Parts Assembly" program. The bond guarantees a rebuilt exchange assembly up to a $5,000 cost. Under the program customers trade-in defective or worn units for a rebuilt assembly and the customer is charged on the basis of parts and labor necessary to rebuild the item to good-as-new condition.

Torpey promoted to district sales mgr.

Herbert G. Torpey has been appointed sales manager for Joy Manufacturing Co.'s Mining and Construction Division San Francisco office. He replaces L. C. "Dusty" Rhodes who has been granted an extended leave of absence. Torpey will manage sales and service of the Joy line for heavy construction and other industry in California, western parts of Washington, Oregon, Nevada, and in Hawaii and Alaska.

New Western sales manager at Copco

Appointment of Martin James as sales manager for its construction and mining divisions serving the Western U. S. is announced by Atlas Copco Pacific Inc. James transfers to the San Carlos, Calif., headquarters of the international organization from a similar position with its Eastern affiliate.



Martin James

Oliver schedules Council meetings at Chicago

The Oliver Corporation's annual Dealer Advisory Council meetings are being centralized this year in Chicago during the week of May 16. Fourteen dealer representatives, together with Chicago management personnel, plant managers and engineers, will participate in the four-day discussions on products, policy and procedures. Heretofore the meetings were held at 20 branch sales offices.

Gar Wood hopper trailers marketed nationally

Gar Wood Industries, Inc., Wayne, Mich., announces that their full line of open and closed hopper trailers will now be marketed nationally through the Gar Wood-St. Paul distributor organization. They have been manufactured on the West Coast for the past eight years. In making the announcement, H. H. Hippler, assistant director of sales, added that "Mono-Shell hoppers are a completely proven product which have enjoyed great success through the West."

New system gives greater service to Cummins owners

Cummins Engine Co. of Columbus, Inc., the nation's largest independent manufacturer of diesel engines, has installed a high-speed system linking headquarters with 48 of its distributorships and 15 regional offices. The system provides customers with the advantage of rapid emergency parts order service, and according to C. R. Boll, vice president — sales, "The communication system literally moves distributors and Cummins users next door to the factory."

Duff-Norton executives elected vice presidents

Elevation of Richard G. Nolte from vice president and general manager of Duff-Norton Co., Pittsburgh, to executive vice president is announced. Two other executives were named as vice presidents of the jack and hoist manufacturing company: T. W. Krueger, general sales manager; and Cleighton Hilbert, former general manager of the Coffing Hoist Division, now vice president—manufacturing.

Barber-Greene appoints Dale Fisher

Barber Greene Co., Aurora, Ill. announces that Dale Fisher has been appointed to head the company's Spreading Equipment Sales Section. He succeeds G. Richard Lundberg who has been made district sales manager in Seattle, Wash. Prior to his promotion, Fisher was employed in the Section promoting the B-G line of asphalt pavers and its Road Widener.

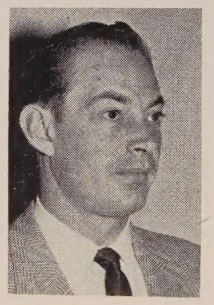
Wacker appoints in Northwest

Wacker Corp., Hartford, Wis., manufacturer of portable compaction equipment, announces appointment of Robert L. Banks, Spokane, Wash., as district representative covering Washington, Oregon, Idaho, Montana, Utah, and west Canada. He is assigned to Wacker's subsidiary office, Wacker West, Inc., in Oakland, Calif.

Robert L. Banks

J. Albiez appointed sales manager

The appointment of Joseph Albiez as general sales manager, Construction Machinery, of Curtiss-Wright's South Bend Division has been announced by S. R. Shafer, division manager. Albiez has been active as product sales manager and as technical sales manager since Curtiss-Wright's entry into the construction machinery field and had many years prior experience with the predecessor company.



Joseph Albiez

International appointments

Howard M. Henke has been named Southwest Region service supervisor of International Harvester Co.'s Construction Equipment Division, with headquarters in Dallas, Texas. He replaces J. S. Boyd who has been transferred in the same capacity to the Northwest region.

IH Tractor Works, 50 years old

International Harvester Co.'s Tractor Works at Chicago is celebrating its 50 anniversary of tractor production. During the half-century more than a million items have been manufactured at the plant: crawler and wheel tractors, power units and bullgrader and bulldozer blades. From a small beginning with the building of 17 huge, friction-drive wheel tractors and 196 employees in 1910, the Works today consists of 33 buildings and a normal employment of 5,000 persons.

Larry Aubrech moves to new post

Larry J. Aubrecht has been appointed director of management consulting services on the Western region staff of Ebasco Services, Inc., with headquarters in San Francisco. The office is headed by H. K. Breckenridge.

Joe Fabbri retires

Giuseppe "Joe" Fabbri, known as "Mr. Rebar" to many West Coast construction men, retired after 47 years of service with Soule' Steel Co., San Francisco. Joining Soule' in 1913 when it was a 3-man organization, Fabbri has been associated with the manufacture of reinforcing bar for nearly a half-century.

Lyle H. DeVilling joins Fairfield

The Fairfield Engineering Co. of Marion, Ohio, announces the appointment of Lyle H. DeVilling as sales manager of the Standard Products Division. Prior to joining Fairfield, he served as manager of field sales for Blaw-Knox Co., Construction Equipment Division.

Flyable dome to house Ford show

The role of industrial tractors and equipment in the '60s will be shown to more than 120,000 persons in 24 cities this spring by a traveling Ford "Cavalcade" show. The Cavalcade, which is being staged by the Ford Tractor & Implement Division, will feature a musical stage show, as well as four acres of equipment displays and outdoor demonstrations. Highlight of the show is a giant flyable geodesic dome, 3 stories high and 110 ft. in diameter, with a water-proof nylon "skin" to protect spectators from the weather, which will be assembled at each location.

Goodman names new product manager

Goodman Manufacturing Co. announces the appointment of John J. Seerley as product manager, contractor equipment sales. A graduate engineer, Seerley will concentrate his efforts on Conway muckers, locomotive and belt conveyors used by contractors. His headquarters are at the company's main office in Chicago.

Gregory Industries enters powder actuated tool field

Gregory Industries, Inc., manufacturer of Nelson stud welding equipment and studs and of Bulldog concrete anchoring devices, announces its entry into the powder actuated tool and fastening business, which will be handled through its recently established Nelson Stud Driver Division. Rowland "Roy" Kopf, prominent figure in this industry, has been appointed manager of the Division, with headquarters in Lorain, Ohio.

P. J. Wolfert heads Quick-Way sales

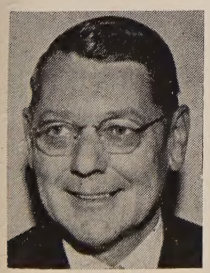
Paul J. Wolfert has been appointed director of sales for Quick-Way Truck Shovel Co., Denver, Colo. Before joining Quick-Way,

Paul J. Wolfert

Wolfert was sales manager of Fairfield Engineering Co.'s Standard Products Division.

Don Tull elected Cummins president

Election of E. Don Tull as president of Cummins Engine Co., Inc. is announced. Tull, one of the earliest of Cummins employees, has



E. Don Tull

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Rates are $15.50 a column inch. Copy should be sent in by the 15th of month preceding publication date.

POSITIONS AVAILABLE

DISTRICT SALES REPRESENTATIVE

Manufacturer of rock crushing equipment seeks representative to cover Pacific coast states. Excellent opportunity for experienced man who can work with distributors.

Reply in full confidence to: Box 5B, WESTERN CONSTRUCTION, 609 Mission Street, San Francisco 5, Calif.

POSITION WANTED

EQUIPMENT MANAGER

General equipment superintendent for heavy construction fleet. Set up and control equipment costs. Purchase new and used equipment. Supervise complete maintenance operation. Modify and design special equipment. Write to Box 5A, WESTERN CONSTRUCTION, 609 Mission Street, San Francisco 5, Calif.

been executive vice president since 1955. He succeeds R. E. Huthsteiner who resigned earlier this year.

Important appointments by Erie Strayer Co.

Erie Strayer Co., Erie, Pa., maker of concrete plants and clamshell buckets, announces two appointments: Roger L. Strayer, vice president, has been named head of a new research and development department. Arthur B. Kinley has joined the company as sales manager of the Bin Division. He brings to Erie Strayer an experience of 12 years sales-engineering experience in the construction equipment industry. These years were spent with Allis-Chalmers and with the Noble Company.

Ryerson ups two at San Francisco

Announcement is made by Robert H. Wasz, general manager of Joseph T. Ryerson & Son, Inc., San Francisco Bay area plant, of the following appointments: Named construction product sales representative is Charles E. Nunes, while new manager of reinforcing products sales for this plant is Jack H. Gillan.

Brosy heads Western sales

Robert L. Brosy has been elevated to the position of manager of the Western division of Timber Structures, Inc. Brosy, who has been manager of the Seattle district office since 1951, will headquarter at Portland and will be in charge of sales in the thirteen Western states. Succeeding Brosy at the Seattle office is William R. Warner.

Simplex Forms acquires Hydro-Fog

Simplex Forms System, Inc., Rockford, Ill., has acquired the manufacturing and distribution rights of the Hydro-Fog units for spraying concrete forms or spraying curing compounds or masonry water-proofing. To be known as Simplex Hydro-Fog, the equipment will be available in three models to suit varying conditions.

C. W. Mohme heads WESCON division

Western Conveyor Co., Boise, Idaho, announces appointment of C. W. Mohme to head its new Contract Engineering Division. Mohme joined Western Conveyor two years ago as chief engineer of the firm which manufactures materials handling and construction equipment. Prior to that he was with the H. K. Ferguson Co. in San Francisco.

Lowrey named Browning sales manager

J. S. Lowrey was named sales manager of Browning Manufacturing Co., San Antonio, Tex., replacing A. D. Kindig who has retired. Lowrey has been with Browning four years as a regional sales manager.

Shapland appointed chief engineer

John S. Shapland has been appointed chief engineer of the C. S. Johnson Co., a division of Koehring Co. manufacturing concrete batching and mixing equipment. He joined the Johnson Company in 1954 following 13 years with the Corps of Engineers, and had been assistant chief engineer under T. B. Appel, Jr., who died recently.

ADVERTISERS in this issue