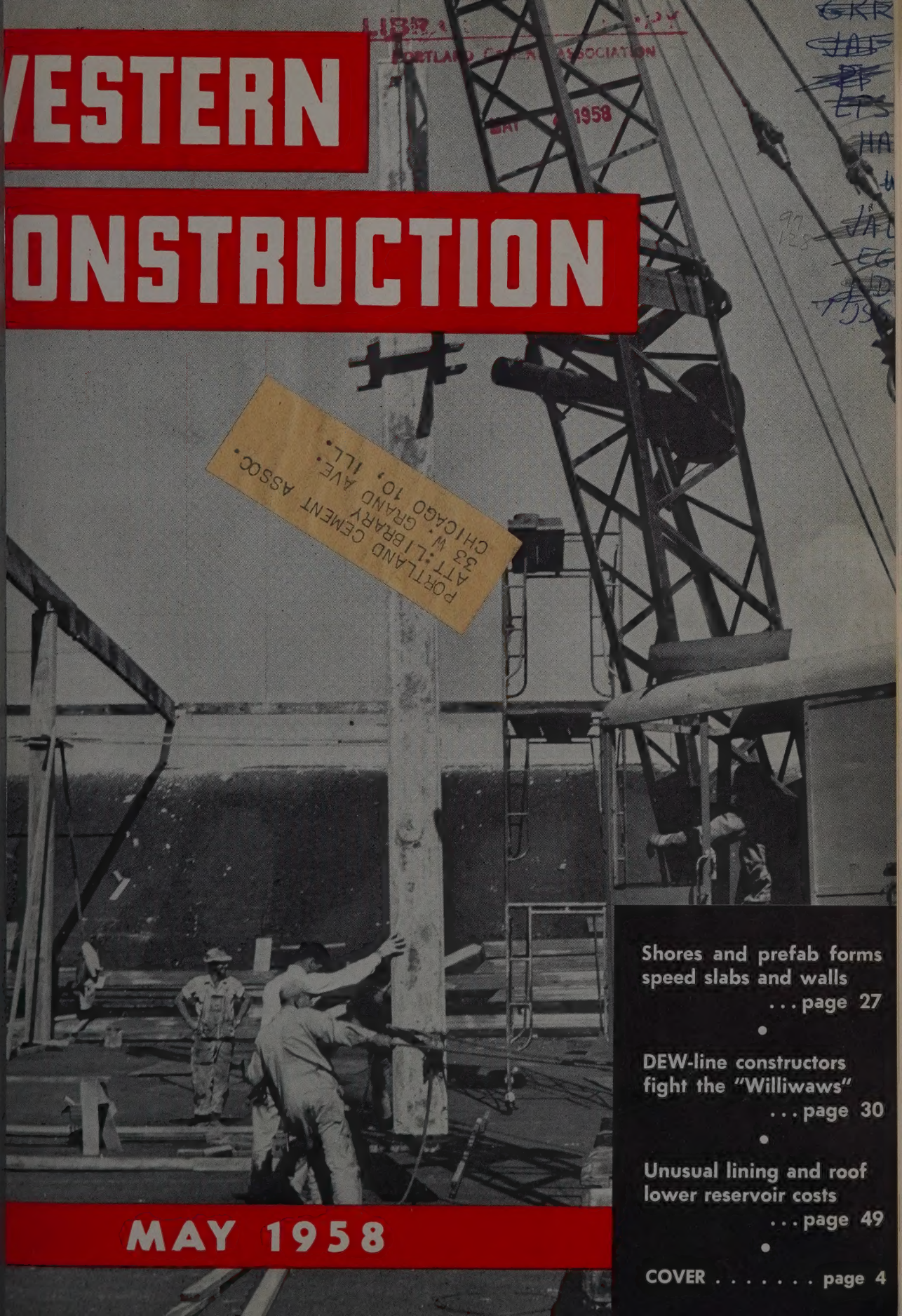
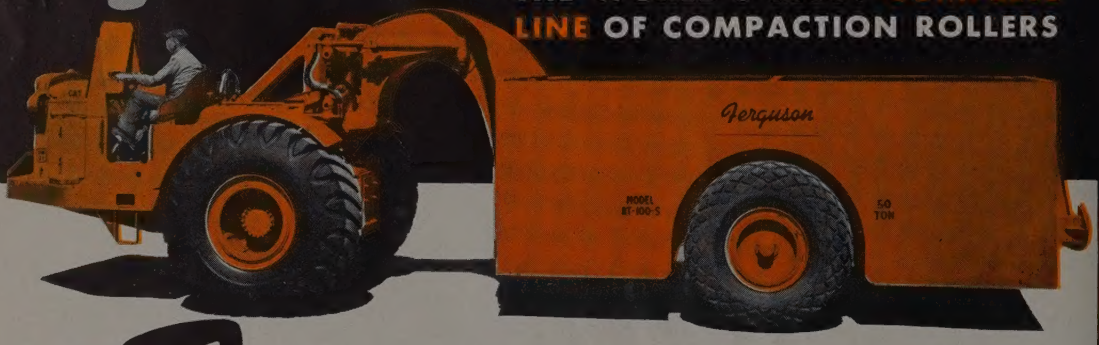
WESTERN CONSTRUCTION



MAY 1958

THE Ferguson LINE...

THE WORLD'S MOST COMPLETE LINE OF COMPACTION ROLLERS



THE Ferguson 50 TON RUBBER TIRED ROLLER

● For the compaction of large yardages, the FERGUSON 50-ton is standard throughout the world. Tire pressures from 90# to 150# p.s.i. Available with gooseneck tongue for all rubber-tired tractors or straight tongue for crawler tractors. Will compact 15,000 cubic yards per day, depending on soils.

Also available in 60, 100 and 200 ton sizes.

ROLLERS FOR EVERY PURPOSE

We manufacture tandem rollers in 2-3, 3-5, 5-8 and 8-12 ton sizes.

Ferguson and Gebhard tamping rollers are built in all practical types and sizes.

Ferguson self-propelled rubber-tired rollers in 10, 12 and 25 ton models. Gasoline and diesel engines.

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...those HEAVIER JOBS!

Have you seen the new Northwest 35-ton Truck Crane? The big 41 TC in the illustration is handling heavy barge sections for assembly on a bridge job in Holland, Michigan for Brown Bros., of Lansing. If you are considering high-capacity, rubber-tired crane equipment you should see this Northwest before you buy.

It's smooth in operation. The Northwest Independent High Speed Boom Hoist gives you boom control the like of which you have never experienced before. It is power controlled both up and down and it operates independently of any other machine function without sacrificing either of the main hoist drums.

Removable counterweight makes the reduction of gross weight a matter of minutes and pivoted gantries are quickly raised and lowered under power for clearance.

The "Feather-Touch" Clutch Control assures ease of operation and gives the *feel of the load* without resorting to pumps, compressors, valves, tubing and other delicate mechanisms. Add to this a dozen other advantages that help you make money, many of them standard equipment. It is a high capacity, mobile package of lifting power.

And the carrier, remember, is Northwest designed —built to Northwest specifications for crane service and tested for 35 ton Crane capacity. It incorporates Northwest features found in no other carrier.

Here is a combination that gives you the best in mobility and crane ability. See it! Ask about it!

NORTHWEST ENGINEERING COMPANY
135 South LaSalle St., Chicago 3, Ill.

BUILT IN TWO SIZES
25 TON AND 35 TON

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WESTERN CONSTRUCTION

KING PUBLICATION

May
1958
Vol. 33 No. 5

FRONT COVER—Positioning a precast column for the Middlefield reservoir, crawler crane travels over porous asphalt layer on sheets of plywood. See article on page 49.

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For 32 years serving the construction needs of the 11 Western States

No Other Earthmoving Equipment Can Match Production or Reliability of Cat-Athey DW20s-PR20s"

— says J. A. Boyer, Supt., Atlas Construction Co. Ltd.

Atlas Construction Co. Ltd. is enlarging the St. Lawrence Seaway channel east of Iroquois, Ontario, between Prescott and Cornwall. Here the Seaway is the narrowest along the entire waterway. Material being handled is glacial till and weighs approximately 3,000 pounds per cu. yd.

15 Cat-Athey DW20-PR20 Rear Dump Units handle the job. On a 7600′ one-way haul, these high-speed, big-production units move up to the 5500 cu. yds. per 10-hour day. Steady production is maintained because the DW20-PR20 team is easily spotted under the shovel, fast on the haul road and saves time at the dump with positive, clean dumping.

Here's how Mr. J. A. Boyer, Superintendent, feels about the PR20-DW20 units: "They surpass trucks in production, availability and efficiency. We like the Athey Wagon's big capacity, ease of dumping, and loading. Traction and maneuverability are excellent. To date their performance has been outstanding, with little or no repairs. Speed is important – and the rigs easily hit 34 MPH. I am sure that no other earthmoving equipment can match the production or reliability of the PR20-DW20s."

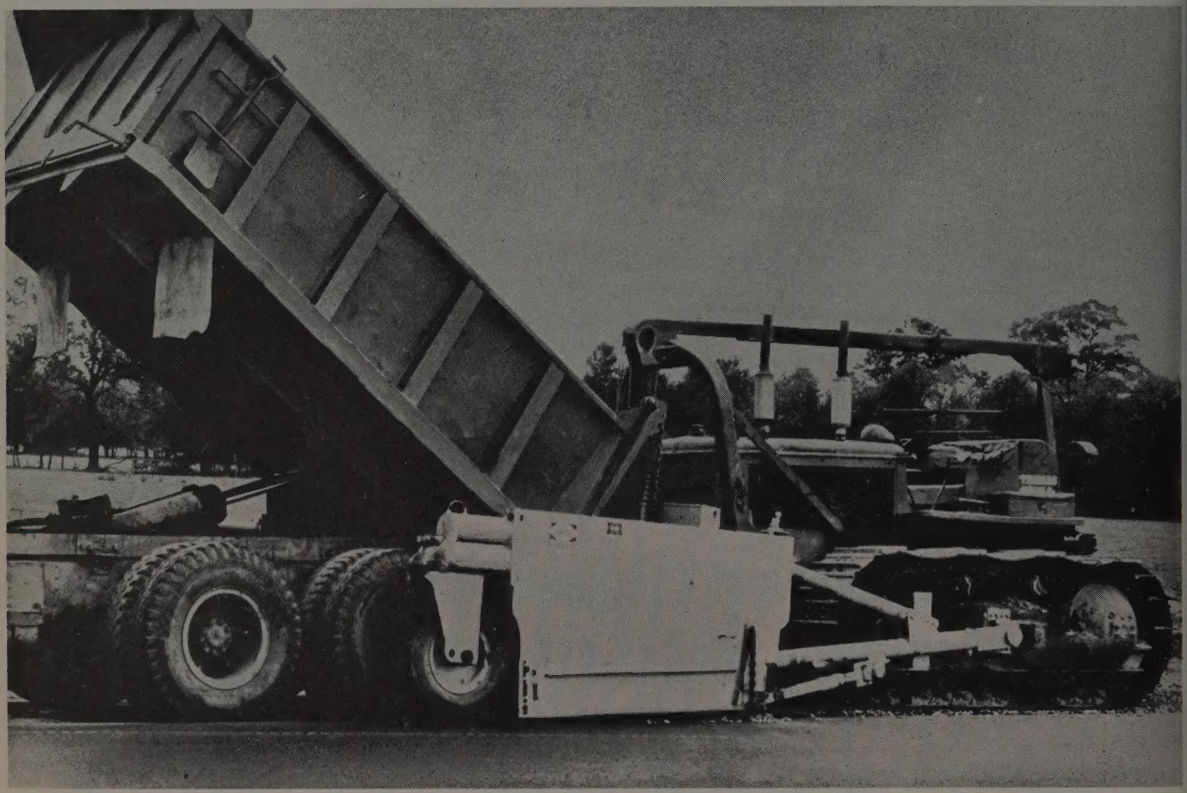
Why take less? You can get top production, too, with an Athey-Caterpillar unit. Your Dealer can recommend the right outfit for your particular needs. See him soon – or write to Athey Products Corporation, 5631 West 65th Street, Chicago 38, Illinois.

Athey

THE COMPLETE TRACTOR-TRAILER LINE ... BY THE LEADERS

NEW EQUIPMENT

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



Tractor-mounted oscillating feeder for base course

Now being marketed by **Blaw-Knox Co.'s** Construction Equipment Division is a new base paver attachment, designed for standard crawler-type tractors with sufficient power for its operation. The attachment, Model P-160, features: 1) an exclusive oscillating screed that promotes accurate depth and level control, quick crown adjustment, and eliminates voiding and segregation; 2) a mounting hitch custom-built for a specific tractor. Other features of the P-160 are high capacity, easy depth adjustment, flexible width adjustment, and an easy loading hopper.

The machine is intended for the contractor whose base paving requirements do not warrant purchase of a complete self-powered base paver.

The attachment will spread stone, slag, gravel, soil, and pug mix aggregates up to 400 tons per hour. Manual screw type controls can be set to spread from 1 to 20 in. deep. The machine's normal 10-ft., 10-in. width can be blocked off to 7 ft., 2 in. Adjustable hinged hopper wings permit a maximum spreading width of 16 ft.

A manually operated screw control provides simplified road crown adjustment. The unit's V-shaped 20-in. high hopper is large, permitting practically any model of dump truck to back up and discharge easily.

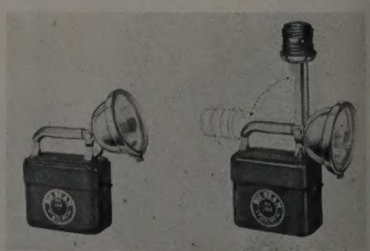
Of primary importance is the fact that the attachment's exclusive angle type oscillating screed, driven by a separate air-cooled engine with electric starter, knits the base material into place more readily for compaction. Joints between adjacent lanes require little or no hand dressing.

The unit's frame is electrically welded plate, channel, angle and tubing. Total weight is 6,100 lb. The attachment, 11 ft., 2 in. wide, can be lifted completely off the road by the tractor for travel.

. . . Circle No. 151

Big Beam markets two new hand lamps

The U-C-Lite Mfg. Co., announces the production of two new Big Beam Electric Hand Lamps



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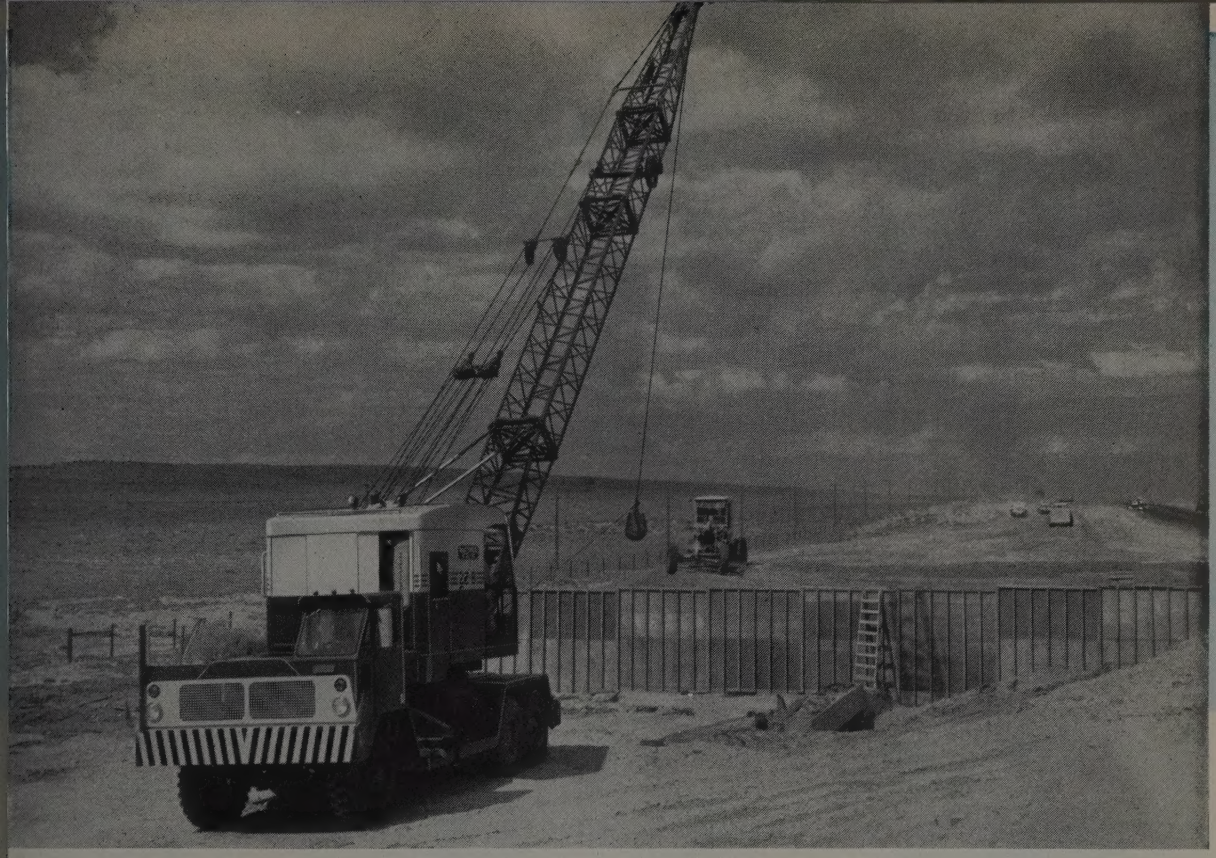

Albuquerque, New Mexico

Transit Machines are a familiar sight on roadbuilding jobs from coast to coast. The 22-B shown here uses a skullcracker to demolish an old concrete bridge. The job is done in reconstruction of a section of Highway 66 west of Albuquerque, N. M.

Transit Machines Benefit This Contractor . . . They'll Boost Your Profits, Too!

You get high production and low-cost dependability when you put a Bucyrus-Erie Transit Machine on your job. Designed to work effectively with any front end, this mobile money-maker offers important advantages to speed job completion . . . help you make money.

Custom-built carrier lets you move fast between job sites. You get reliable, accurate operation with crane front end through power-controlled lowering on the main hoist line and independent power controlled lowering boom hoist (standard on all machines except 11-B). You profit, too, from the design and arrangement of main machinery. Parts are large, simple, few in number — there's little that can go wrong.

Transit Machines are available in four sizes — the 35-ton 30-B, 25-ton 22-B, 15-ton 15-B, and the ALL NEW 10-ton 11-B. Your Bucyrus-Erie distributor listed below is always on call with trained service personnel, factory-approved service equipment, and complete stocks of quality-built Bucyrus-Erie parts to keep your machines in top performing condition. See him soon. Bucyrus-Erie Company, South Milwaukee, Wis.

489E58C-n

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The Colorado Builders' Supply Company ..... Denver, Colo. Casper, Wyo.
West Coast Engine & Equipment Company .... Berkeley, Calif.
Clyde Equipment Company ..... Portland, Ore.; Seattle, Wash.
Crook Company ..... Los Angeles and Bakersfield, Calif.
R. L. Harrison Company, Inc. ..... Albuquerque, N. M.
Lang Construction Equipment Co. ..... Salt Lake City, Utah
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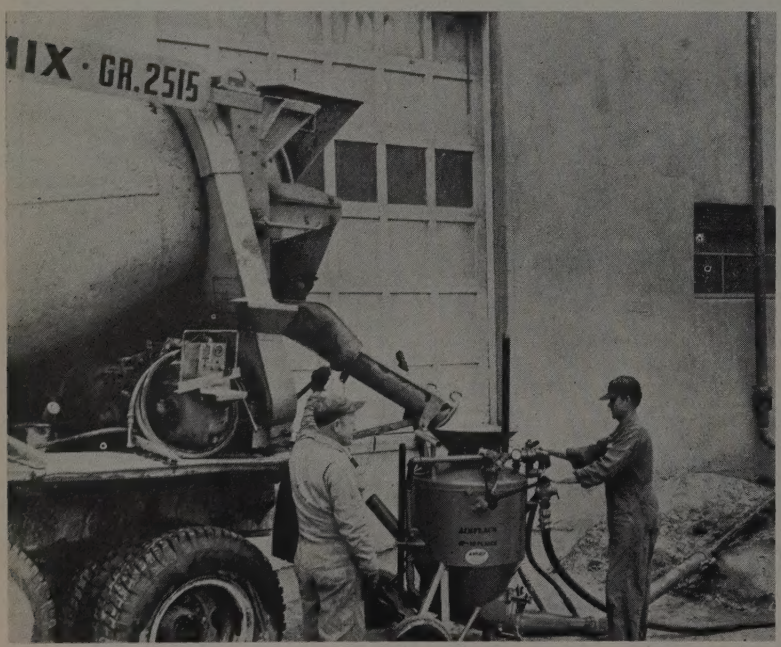
Sanford Tractor & Equipment Co. ..... Reno, Nevada

A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*

featuring Sealed-Beam heads and operating on two standard 6-volt lantern batteries.

Model 264 is a combination white light and red flasher type. A new feature of this lamp is the thermal flasher unit contained in the bulb itself, which eliminates need for separate flashing mechanism. The flasher arm is adjustable for use in either an upright position or in a horizontal plane when folded down over the handle. Two separate switches are provided to operate the flasher and white light independently. Each switch is covered with a rubber boot to prevent water, moisture and dirt particles from entering switch contacts. Switches can be operated with boots on or they can be removed if desired.

The other Big Beam, Model 266, is a moderately-priced, quality-built unit of equal power and brilliance, without the flasher arm. The Sealed-Beam head is of the same type, hermetically sealed and prefocused. Handle and heads are polished chrome plate mounted on steel weatherproof containers, and are finished in bright red baked-on enamel. . . . *Circle No. 152*



Air placement solves many concrete handling problems

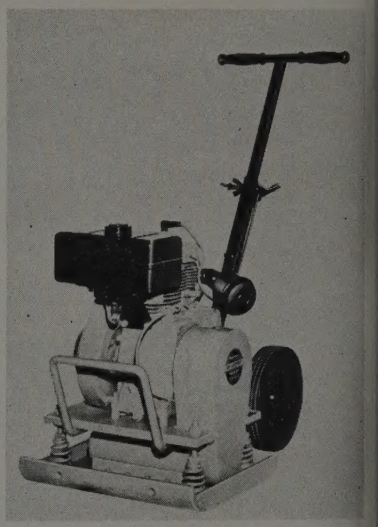
The answers to many concrete handling problems will be supplied by a new method of air placement of structural concrete developed by **Air Placement Equipment Co.** Pictured is the Model CP-10 Airplaco Concrete placer on a typical job application. A 105 CFM air compressor was used to place a 1:2:3½ concrete mix with 1-in. rock, through the 4-in. ID steel concrete placement tubing. This particular job required a 25-ft. vertical lift and a total pipe length of 150 ft. Additional vertical lift and greater lengths of placement tubing can be used simply by increasing the air supply.

The new Airplaco concrete placers are available in two models: Model CP-10 which handles 10 cu. ft. of concrete per charge and Model CP-15 handling 15 cu. ft. per charge. Either 4-in. ID or 6-in. ID concrete placement tubing is available for use with both models. Tubing size to be used will depend upon rock size to be handled, production rate required and amount of air available.

These concrete placers will place concrete with 2-in. slump to 6-in. slump; they will also place the more harsh aggregates, such as Haydite, which normally cannot be pumped with standard concrete pumping equipment. Depending upon the slump of the concrete, the length of placement tubing, vertical lift and air supply, production rates will range from 8 to 20 cu. yd. per hr. . . . *Circle No. 153*

Quick, efficient compaction

Powr-Pactor, a self-powered vibratory compactor, is announced by **Maginniss Power Tool Co.** The new compactor is designed for quick, convenient compaction and



grading of stone, gravel and granular soils around foundations, footings, abutments and pipe lines, in sewer trenches, on bridge approaches and under concrete floor slabs.

Equipped with rollers and water feed attachment, the Powr-Pactor provides fast, efficient compaction of blacktop on highway and city street repairs, around manholes, next to curbs, as well as on driveways, walks and parking lots.

With variable frequencies from 2,400 to 7,000 v.p.m. and a compacting force up to 4,000 lb., the unit produces uniform Proctor densities on any job.

A 6-hp. air-cooled standard carburetor-equipped engine, mounted on a vibration-free plate, drives the vibrator through V-belts. The eccentric rotates on high speed bearings in a sealed housing attached to the compacting plate. Damping springs isolate vibration from the engine and operator's handle, thus reducing operator fatigue and assuring maximum engine life without the use of special engine components. . . . *Circle No. 154*

Johnson portable batcher

The Johnson Tumbleweed, a portable batcher for charging transit mix trucks, has been developed and is now ready for marketing by the **C. S. Johnson Co.** The self-contained batch plant is available

. . . *for more details, adv. following pg., circle No. 15 on Reader Service Postcard* →

Conventional trucks: INTERNATIONAL model A-182 with four-yard dump body, 141-in. w.b., 308 cu. in. engine, 16,000 lbs. two-speed rear axle, heavy-duty springs, double oversize brakes, 9.00 x 20 10-ply tires. 21,000 lbs. GVW.

INTERNATIONAL model A-164 with four-yard dump body, 129-in. w.b., 264 cu. in. engine, 15,000 lbs. two-speed rear axle, heavy-duty springs, oversize brakes, 8.25 x 20 10-ply tires. 19,000 lbs. GVW.

Cab-forward trucks: INTERNATIONAL model ACF-182 with eight-yard dump body, 149-in. w.b., 308 cu. in. engine, 28,000 lbs. tandem drive rear axle, oversize standard brakes, 9.00 x 20 10-ply tires. 33,000 lbs. GVW.

INTERNATIONAL model AC-1892 with five-yard dump body, 137-in. w.b., 308 cu. in. engine, five-speed, constant-mesh transmission, 18,500 lbs. two-speed rear axle, oversize brakes, 10.00 x 20 10-ply tires, 25,500 lbs. GVW.

Need 'em now?

r Heavy-Duty models are ready now for immediate very! Call your INTERNATIONAL Dealer—for delivery from the RNATIONAL *Truck Factory Inventory Pool.*

oose from conventional or cab-forward models complete with s, hoists, frame reinforcements, tow hooks, front directional sig- rear view mirrors both sides, heater-defrosters and oil filter.

meet your specific requirements you can have any or all the fol- g optional equipment installed in a matter of hours: cab protec- extension sides, swinging partitions and spreader aprons.

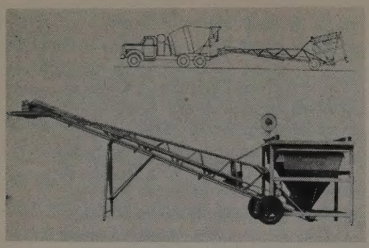
ep your job moving on schedule with INTERNATIONAL Trucks— in six-wheel and heavy-duty truck sales for over 23 years.

ost least to own!

INTERNATIONAL HARVESTER COMPANY, CHICAGO

Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors

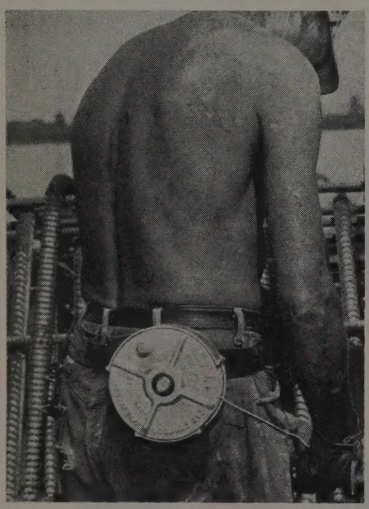
. . . for more details, circle No. 16 on Reader Service Postcard



in 3½ and 5-cu. yd. sizes. Capacities of 25 to 40 cu. yd. per hour are possible, depending upon hopper size and whether the discharge belt conveyor is 18 or 24 in. wide. The 3/16-in. steel hopper is open for charging on three sides, has 60-deg. side slopes and double clam gate for fast, clean discharge to the belt conveyor. A full-reading, cumulative 24-in. diameter weighing scale is standard on the new batching unit. The scale dial (20,000-lb. capacity) can be rotated for visibility from any direction.... *Circle No. 155*

Wire reel speeds tying

Coil-over-shoulder wire tying has been eliminated by a tie wire reel-type dispenser, the product of **Ideal Reel Co.** Called the Ideal Tie Wire Reel, the new product is for such wire tying applications as reinforcing bars, metal lathing, pipe insulation, plant maintenance, shipping rooms and many others.



The wire reel is worn on the worker's belt, and its design permits either right-hand or left-hand usage. It contains a wire filler that is reeled out as it is used. When depleted the wire filler can be replaced within a few seconds.

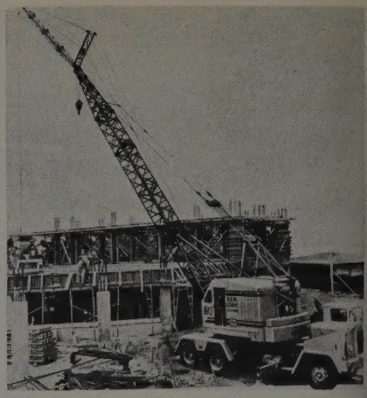
Key features of the Ideal Tie Wire Reels are that they eliminate the dangers associated with wire tying with a coil of wire slung over the shoulder and that they significantly speed wire tying operations. Field usage has shown that the reel permits 6 to 8 more ties per man per minute compared to other methods.

The reel is made of cast aluminum with brass bushings to provide extra long wear. Steel threads cast into the reel housing prevent wear of the aluminum parts. Total weight when loaded is 6 lb.

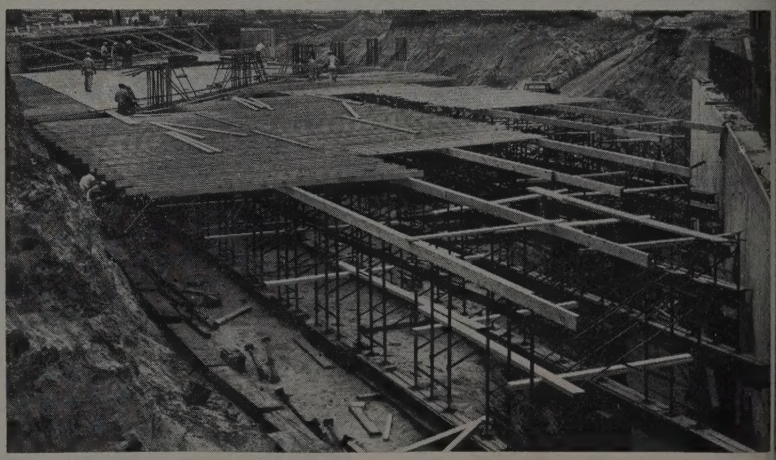
... *Circle No. 156*

25-ton truck crane added to Gar Wood line

Gar Wood Industries, Inc., have added a 25-ton truck crane, the Model 100BT, to their line of cranes and power excavators. The 25-ton unit features a hydraulic counterweight removal system, a choice of 6 x 4-ft. or 6 x 6-ft. chassis, and high capacity clutches and brakes for above-average precision in steel erection work. Both sizes



of the Gar Wood-built carriers feature a detachable rear outrigger housing which conveniently allows gross weight to be reduced to conform to highway load restrictions. A live boom hoist, direct gear drive, conical hook rollers and fabricated machinery deck are also featured in the new machine. ... *Circle No. 157*



Steel shoring costs proven less than timber

Steel shoring frames are actually less expensive than lumber falsework. True, the initial cost of steel shoring is greater but look at these facts recently published by **Tubular Structures Corp. of America** in a booklet on their heavy-duty steel shoring frames. Erection labor costs for lumber are 480% greater than for steel; dismantling labor costs, more than 103% greater. Losses on non-structural members per job amount to 5200% more when lumber is used. And so on down the line.

Tubular Structures has developed two unique shoring frames which are being used by construction companies throughout the country. These new frames are engineered to support bearing loads up to 100,000 lb. Ultimate load on a single frame when desired. The frames are designed essentially for shoring, so that economies in their design and construction can be perfected. They are multiple purpose, however, and are being used for many other construction applications, such as heavy slabs, for all engineering projects, building and general construction, "T" beams, fish ladders, scroll cases, lineal exterior scaffolding, stationary and rolling towers.

These frames retain their capacities whether they are supporting loads 10 ft. in the air or 100 ft. in the air. The cross bracing system used in this type of shoring eliminates the effect of slenderness ratios and the original column strength is preserved at any height.

... *Circle No. 158*

(Turn to page 114 for more New Equipment. For best manuals on portable hoists see page 102.)

WESTERN CONSTRUCTION

Loose Use of a Clear Definition

THERE IS TOO MUCH loose talk and fuzzy comment about the term "public works." From politicians to newspapers this accurate title is kicked around and ascribed many incorrect meanings either deliberately or from ignorance.

To the general public, newscasters, and legislators the term "public works" seems to mean some mysterious type of construction activity that is turned on and off to fit an artificial need. It is implied that at certain times we have almost no public works and at other times we readily turn them on to assist the economy. The pros and cons as to effectiveness of such an accelerated program is not the immediate point.

Every day and month after month public works are being constructed in every state and every locality. They originate at the federal level and on down to the smallest political subdivision. Broadly, the term applies to any work which is carried out at public expense, and for the over-all benefit of those paying for the undertaking. Construction work lying outside of this general definition—excluding residential and farm—is confined rather closely to commercial and industrial buildings, plants and facilities for private enterprise.

When the politician discusses a "public works program" he is merely talking about an extension of the wide variety of construction activity that accompanies normal growth of the nation or any region. This means that any program has significance in the West because public works are essential to areas of accelerating growth and expanding population.

Too many times recently the reference to public works has been tied closely to the concept of "make-work" projects. Such connection recently appeared in the *Wall Street Journal* with a sentence, "The justification for public works is relief—perhaps the most costly way of providing relief." This same comment referred rather loosely to the title Public Works Administration which gets uncomfortably close to the confusion that existed between PWA and WPA in the '30s.

Proponents of the benefits from an accelerated program must be cautioned that these projects require much preliminary engineering and are not adapted to fast starting. Opponents should be equally aware of the fallacy of counting merely those jobs created at the site. Normal public works are not leaf raking and they tend to set in motion a chain reaction of jobs in providing construction materials, equipment, supplies, and services.

The West has its past and future deeply rooted in public works. Even the superprojects considered completely unnecessary two decades ago have permitted the growth of the modern West. The same will apply to the works of today and tomorrow at federal, state, and municipal level. These legitimate projects carried out under normal operations by the construction industry should not fall under the shadow of a title used loosely or indifferently. The construction industry of this region should see that the term public works is properly understood, with an appreciation of their benefits to future growth of the West.

Jim Ballard

The A-W Hydraulic Crane... most versatile piece of equipment

according to D. R. Smalley & Sons, Inc., Celina, Ohio

D. R. Smalley & Sons, Inc., is a major Ohio road and excavating contractor. The company is now engaged in relocating a section of U. S. 40 north of Dayton. The project, entailing 1,400,000 yards of cut and fill and 20 miles of 2-lane pavement, is estimated to cost $4,800,000.

Francis Smalley tells us: "In 1955 we decided to buy an A-W Hydraulic Crane to assist with the maintenance work on our heavy construction equipment. It quickly proved its value on such jobs as changing transmissions on trucks and tractors and for lifting out and transporting engines to the shop for overhaul. It is also useful for removing crawler tracks and roller frames from tractors.

"We find many other uses, too, for this highly mobile unit. Loading and unloading materials such as barrels of fuel oil, curing compounds, and air entraining agents. In addition, we have found it very effective for laying reinforced concrete tile of up to 24-inch diameter.

"The A-W, in our opinion, is an exceptionally handy tool—our most versatile piece of equipment. Any contractor who does his own maintenance work will find dozens of jobs for it to do."

Find out how the A-W Hydraulic Crane can help you reduce downtime and build profits. See your nearby A-W distributor or write us.

Austin-Western

Construction Equipment Division Aurora, Ill.

BALDWIN BLH LIMA-HAMILTON

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WESTERN MACHINERY COMPANY — Phoenix
CALIFORNIA—
EDWARD R. BACON COMPANY — San Francisco 10
SMITH BOOTH USHER COMPANY — Los Angeles 54
COLORADO—
MACDONALD EQUIPMENT COMPANY — Denver 16
IDAHO—
ENGINEERING SALES SERVICE, INC. — Boise
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WYOMING—
KEREMI TRACTOR & EQUIPMENT COMPANY — Cheyenne

KING PUBLICATION

WESTERN CONSTRUCTION

MAY 1958

New form system speeds concreting

Forming slabs with sturdy prefab panels is highlight of unusual construction methods which are cutting costs on concrete parking garage.

A NEW FORMING and shoring system in which prefabricated panels are used to form floor slabs is resulting in a great reduction of labor costs on a San Francisco building project. The structure is a 4-level, 1,000-car parking garage at 5th and Mission Streets, being built for the San Francisco Parking Authority, the Downtown Parking Corp., and the City and County of San Francisco.

General contractor on the $1,500,000 project is the William J. Moran Construction Co. of Alhambra and Oakland, Calif. Subcontractor for the concrete work is Hayward Construction Co. of Hayward, Calif. The building is almost entirely of reinforced concrete.

Hayward Co. arrived on the job late in November 1957. By July 1 they were to pour 13,500 cu. yd. of concrete, with an area to be formed of over 400,000 sq. ft. of which 300,000 were elevated floor slabs, plus 408 cylindrical columns 8 ft. high. This would be a tight schedule under the best conditions. As it has turned out, San Francisco has had its wettest spring in 70 years and the project has lost 15 days already because of rain. Despite the bad weather, however, the job is expected to finish on time, chiefly as a result of the variety of unusual construction techniques being used.

Right from the start Hayward used the most up-to-date construction methods and equipment. A Porta House was set up overlooking the site to serve as an office. (Moran is also using a Porta House.) About 30,000 sq. ft. of Richcraft Paper Co.'s plastic film was brought to the job to protect materials from the rain—one large swath covers a tool shed, thus eliminating the need to repair the roof. Sonotubes were ordered from Sonoco Products Co. to form the 408 cylindrical columns. An Econmobile, a front-end-loader type machine with a 22½-ft. high reach, was purchased from American Road Equipment Co. and fitted with a concrete bucket attachment to transport concrete from transit

RIGHT—Workmen set a 2 x 6-ft. panel in place on junior I-beams supported by braced network of Acrow shores. Small dowels on I-beams keep panels tightly aligned.

← For more details, circle No. 19 on Reader Service Post Card

DIAGONAL WIRE with turnbuckle is added about every 30 ft. to provide sway bracing. At right, shore is checked with level for plumbness as turnbuckle is tightened.

AN ECONMOBILE with concrete bucket attachment is used to carry concrete from transit trucks to walls and columns. Wall shown is curved, ruling out prefab forms. Column at right is one of 408 to be formed by Sonotubes 8 ft. high.

trucks to the columns and walls.

Although the specifications limit the maximum area which can be poured at any one time to 4,000 sq. ft., a situation which would suggest the use of concrete buggies, Hayward is trying a Chain Belt Co. Railporter, a monorail with side dump cars. It is generally thought that the Railporter can be used efficiently only when the transit trucks can't get close to the work or when slabs of much larger area are being poured. For example, James Walker, Hayward's superintendent, once used a Railporter with great success on a Texas project by running the monorail track ½ mi. across muddy ground from the job site to the nearest highway. On the present job, as soon as the workmen get accustomed to this rather unusual piece of equipment, Hayward hopes to prove that the Railporter can be used profitably on jobs where the slab area is relatively small and where the concrete trucks can move in close.

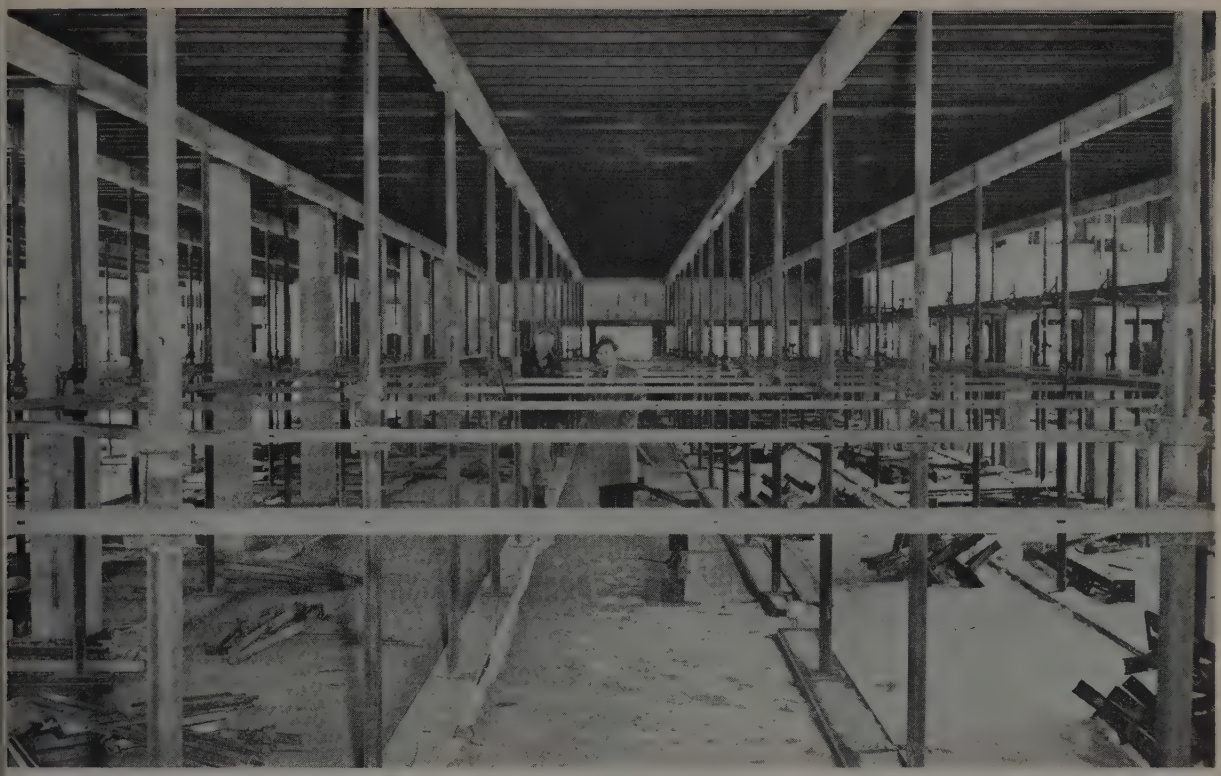
Choosing the forms

Before deciding on how to form and shore the slabs, Les Horton, general manager of Hayward Construction Co., took a trip to Denver to watch a project on which a new system was being used by the AA & EE Jones Construction Co. The main feature of this system is the prefabricated modular panels which are used to form the slab. The same panels are used for the walls. Last year the Jones Co., which developed this system and fully protected it with patents, reached an agreement with the internationally known shoring and scaffolding firm of Acrow Engineers, Ltd. The necessary forms, shores, and braces are now being made available all over the world by the Acrow organization.

It didn't take long for Les Horton to be convinced. He bought enough to form and shore 42,000 sq. ft. Even though his first cost was about twice that of conventional job-cut plywood and lumber falsework, he figured that this would be more than offset by greatly reduced labor cost — about half as many man-hours would be required to set it up and strip it. His later experience showed that perhaps 2/3 was a better estimate of labor savings.

The plywood panels are sturdily backed with steel box-sections which enable them to span their full length without additional support. The arrangement of this reinforcing on the panels can be seen in the accompanying photographs. On the 5th and Mission Street project, all the panels are 2 ft. wide and vary in 1-ft. steps from 2 to 6 ft. long. They are not being used for the walls on this project because the non-uniform nature of the walls would require too many special fillers. The Acrow shores being used are telescoping steel tubes smoothly adjustable from 6 ft. 7 in. to 11 ft. This wide range of adjustment is especially handy in supporting the forms for the spiral ramps which connect one floor of the parking garage to the next. Acrow calls the overall forming technique the V-form system. The V stands for versatile.

Here are the steps Hayward workmen follow in setting and



LARGE SECTION of assembled shores, braces and forms can be set up and stripped quickly. Panels stay in place when supports are removed by means of small anchor hooks embedded in concrete which are connected to panels by wing nuts. Shown is a Denver, Colo., job.

stripping the forms: First, 2 x 8 planks are placed in parallel rows 6 ft. apart. Every 8 ft. along these rows of boards a shore is positioned vertically and nailed lightly to the board. The lengths of the shores are set by extending the inner tube the proper amount and fixing it by inserting a pin through a slot in the outer tube into the nearest of a number of holes in the inner tube. The fine adjustment is made easily by turning a collar which runs on a threaded section of the outer tube and which bears against the pin.

The shores are braced horizontally 4 ft. 8 in. above the floor by light rolled steel channels which are punched with holes every 4 in. Assembly is made rapidly using small eye-bolts and wing nuts. Hayward is adding diagonal sway bracing about every 30 ft. in the form of a steel wire with a turnbuckle. The turnbuckle can also be used to plumb the network of shores and braces.

When the braces are in place, steel junior I-beams 8 ft. long are placed on top of the shores forming parallel rows in the same direction as the boards.

The panels are then placed on the I-beams spanning from one row to the next. No clips or wedges are needed to draw the panels tightly together. This is taken care of by small dowels which protrude from the top of the I-beams and which fit into holes in the panel stiffeners. Similar dowels and holes keep the I-beams located properly on the tops of the shores.

Stripping is fast. First, the shores are shortened about an inch by turning the threaded collar. This frees the junior beams from the dowels in the bottom of the panels. The beams are then lifted off the top of the shores. The panels stay in place because of a small steel anchor several inches long which protrudes from the center of each panel and is imbedded in the concrete. When the workmen are ready to remove the panels they unscrew a small wing nut from underneath the panel which holds it to the anchor hook. The panel is then pulled away and the small stub of the anchor bolt is broken off in the same manner as a snap-tie.

Since each panel is removed separately there is no chance of a serious accident resulting from the sudden release of a large area of forms.

An interesting method has been worked out to move the panels to the next point of pour. The concrete bucket on a motorized buggy was removed and replaced with a platform. The buggy and the platform are small enough to move around between the rows of shores under the slab. Two men stand on the platform and the buggy moves along at a speed which enables the men to take down the panels one at a time and stack them on the platform. The Railporter is also under consideration for this materials handling task.

Free literature available from Acrow of California which describes the V-form system is reviewed in the New Literature section of this issue.

Personnel

Consulting engineers for the design and supervision of the project are John J. Gould and H. J. Degenkolb. Aleck L. Wilson is consulting architect and William Wright is land surveyor. Dames & Moore were soil consultants.

Richard Curtis is project manager for general contractor William J. Moran.

For Hayward Construction Co. Les Horton is general manager and James Walker is superintendent.

CAMPSITE was located behind the hills in an effort to escape some of the fury of the winds. In spite of buildings designed to cope with the gales, the roof of the meat storage shed sailed off like a kite one day, and a stack of wooden forms peeled off like a deck of cards.

Fighting the Aleutian "Williwaws"

Gales whip the construction site of a radar station on Umnak Island, 900 air miles west of Anchorage. Fog, rain, snow, and always the wind combine to make weather the major construction problem.

BY W. R. (DICK) HUNTINGTON
Project Superintendent
Baker and Ford Construction Co.

As told to
CLIFFORD CERNICK

"BIRTHPLACE OF THE WINDS," that's what they call the Aleutian Islands. They are also the birthplace of a lot of problems for the construction man. And most of these problems are not of the sort the contractor would encounter anywhere else in the world.

As project superintendent for Baker and Ford Construction Co. of Bellingham, Wash., I was able to observe some of these problems first hand when our firm was awarded a $4,643,647 contract for construction of a radar station on Umnak Island. The project site (see map) is not far from the village of Nikolski and is 900 air miles southwest of Anchorage.

The project is one of six new radar stations which will extend the far-northern fence of Distant Early Warning stations, known as the DEW-line, along the stepping stones of the Aleutian Islands. Contracts are being supervised for the Air Force by the Alaska District of the Corps of Engineers. Besides the Nikolski site, stations are being constructed at Port Heiden, Port Moller, Cold Bay, Cape Sarichef and Driftwood Bay.

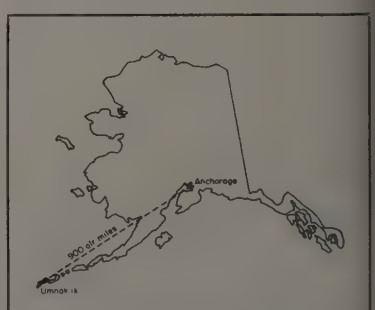
Most construction men who have ever worked in this part of the country will agree that the major problem encountered in the Aleutians is weather. The weather on these desolate islands can, I believe, be called "the windiest in the world." With terrible suddenness, Aleutian windstorms known as "williwaws" sweep the islands. These destructive winds are born where the warm air above the Japanese current runs up against the icy air masses from the north.

In December and January at Nikolski, winds with gusts up to 110 mi. an hr. are not uncommon. Structures must be designed to withstand wind velocities of up to 170 mi. an hr. Construction men at Aleutian bases do their best to prepare for these cantankerous gales, but sometimes their best efforts are to no avail.

At Nikolski, the struggle to construct installations in the face of the world's worst weather conditions began with the start of surveys in April of 1957. Survey crews soon found it was virtually impossible to operate transits and levels while being lashed by howling winds and driving rain. Attempting to make notes on observations at such times proved a hopeless task—and surveys had to wait for the brief periods of suitable weather.

Barging and unloading

Very much the same weather prevailed when the first barge came



900 AIR MILES SOUTHWEST OF ANCHORAGE THE JOB SITE IS ON UMNAK ISLAND.

olling in with equipment for the ew base. Bargeloads of cement nd lumber for warehouses came hrough stormy seas undamaged—ut there were many anxious mo-ients. Despite tricky currents and ind-lashed waves, the Foss Tug nd Barge Co. successfully brought n a triple-tow of three 700-ton arges. Foss also made three single ips with self-propelled barges and ne single-tow. So far as Alaskan hipping is concerned, I believe the iple-tow in this case was the first ver attempted.

Since there is no dock at Nikol-ki, barges had to be beached be-ore they could be unloaded. This usually a ticklish proposition nder Aleutian conditions.

Dirt movers and heavy equip-ent operators were brought in to art construction of an airstrip. his was a high-priority job, as was lasting out a road from the beach the camp site and from there to he job site.

Another high-priority phase of he work was setting up a ware-ouse for cement and other ma-erials needing protection from the eather.

Our camp site is located in a addle about 3.5 mi. from the each. The job site is on Nigger-ead Hill, a butte rising abruptly 00 ft. on its south slope. The butte approximately 200 ft. higher han the surrounding terrain, the ummit being about 750 ft. above ea level.

Weather, right from the start

Right from the start, the weather layed a cat-and-mouse game with ur construction efforts. As I've in-icated, our biggest hazard was the ind. There's no question about it, Aleutian williwaws are really tough and can do a lot of damage around a construction site.

When a gale begins, construction crews get the order to knock off. There's real danger to personnel if they should happen to get caught up on the scaffolding in a sudden storm.

I've seen a howling wind rip up strips of 2 by 12 scaffolding and carry them away, even though the scaffolding was firmly attached to a wall with metal brackets and lashed down with No. 9 wire. Sometimes the wind plays funny tricks on this construction job. In one instance, the mere suction of the wind whipping past stripped the decks off a roof even though they were securely nailed down.

Once the roof of the meat storage shed on the mess hall went sailing like a big kite over two buildings. The roof section crashed into the front of a car parked in front of the project engineer's office shattering the windshield and denting the hood. On another occasion, large sections of form panels stacked on a pile blew away as if they were so many playing cards in a deck. Lashing down construction material so it won't be blown away is a necessity.

Protecting forms from wind damage is another problem. We found that the best thing to do in this regard was to use metal shoring to brace forms in lieu of conventional bracing.

Progress on a construction job in the Aleutians can be hampered by the very changeability of the weather. At Nikolski, we've seen as many as 57 varieties in one day. It's not uncommon to see rain, fog, snow and combinations of all those in gales and in perfect calm—all in just one 24-hr. period.

WHEN WIND AND weather were at least reasonable, the actual construction operations were not particularly difficult. Crew is building foundation for generators.

IGH MORALE at the isolated site resulted from good food, adequate quarters and pleasant urroundings such as this lounge in the Engineers building. Left to right: Capt. Alfred J. Rabo-liatti, assistant resident engineer; Walter J. Harris, project engineer; Art Cassler, assistant project ngineer.

Morale stayed high

Understandably, such miserable weather can be detrimental to morale as well as materials. Yet, despite all the punishment the williwaws can hand out, morale on the project is high and the turnover of personnel is no greater than would be expected on a stateside job.

What accounts for this high morale on the Nikolski job? For one thing, I'm convinced that doing a craftsmanlike job in the face of heavy obstacles represents a stimulating challenge to the conscientious construction man.

The importance of living condi-

TRIPLE TOW of barges loaded with equipment and supplies for Nikolski. This operation of Foss Tug and Barge Co. is believed to be the first triple-tow in this part of the stormy North Pacific.

MOORED TO A Cat D-8 to foil sudden gales, this amphibious plane was used by the Corps of Engineers to transport personnel to DEW-sites in the Aleutians. Baker and Ford Co. used a similar plane before completion of the air strip.

tions can't be over-estimated as a morale factor. At the Nikolski camp, clean, well-lighted, well-heated quarters and tastefully prepared meals go a long way toward keeping personnel happy.

Recreation is another vital factor. Movies are shown twice a week. Reading material is plentiful. Fishing in the area is excellent and good catches of trout and silver salmon are easily obtained. A well-stocked commissary has been provided for the convenience of the men.

Since completion of the airstrip at Nikolski, mail comes in by Reeve Aleutian Airways each week. This service is supplemented by a monthly mailboat which also brings in some construction freight.

At Nikolski, there's less of a feeling of total isolation than is true at most remote construction sites. Only 4.5 mi. away is the interesting native village of Nikolski. Although the village was evacuated during World War II in the face of the Japanese threat, most of the natives have since returned. Today, the village boasts a native school, a native store and 30 houses.

Communication with the "outside world" is maintained by means of a 50-watt radio set.

Equipment was the key

One thing which can damage a construction camp's morale faster than many more obvious factors is having to cope with inadequate equipment. This has never been the case at the Nikolski job. When the project was started, brand new equipment was brought in. The increased work output has proved this to be a wise decision.

Equipment used for transportation of material and personnel includes a large Mack flatbed truck with canopy, six International 4 x 4 pickups, one International Carryall and one GMC Carryall, the latter used by the resident engineer.

For work on the airstrip we used six 12-yd. Mack dump trucks, four DW-15 Cats, one Bucyrus-Erie 38B shovel, a Bucyrus-Erie 22B dragline and a Bucyrus-Erie 22B truck crane mounted on rubber. This latter piece of equipment was used for unloading barges and hoisting materials at the jobsite.

A Cat-112 blade and a Lima Hydraulic Compacter were used for blading and compacting roads and runway.

Also included in the equipment used at the site is a D-6 and three D-8 Cats.

For batching concrete aggregate and loading trucks at stockpiles, a 75 Michigan Loader was used. A model H Scoopmobile with forks was used for moving all miscellaneous material used on the jobsite. Batching equipment includes a Ruby Batch Plant manufactured by Clark Welding Works. The plant is fully automatic. Materials are augered directly into two 4½-yd. Rex Mixers mounted on Mack trucks.

Progress and personnel

The Nikolski project is scheduled for completion by Oct. 1, 1958. Present progress reported on the job is 100% completion so far as concrete structures are concerned and an over-all job completion status of about 80%.

As project superintendent on this unusual job, I've had ample opportunity to make a careful evaluation of the personnel connected with the project. I'm convinced that much of the credit for the high rate of progress and high morale on the job must go to the exceptionally capable crew of supervisors and men.

Among these are Nick Ference, carpenter superintendent; John Koropp, engineer; Ralph Dodson, dirt superintendent; Marvin Kuehnoel, master mechanic; Larry Strengholt and Frank Ellis, carpenter foremen; D. L. Stowell, labor foreman and Fred Smith, superintendent for Haskell Plumbing and Heating of Bellingham, Wash., a sub-contractor.

Ed Tetrick is superintendent for Holland Electric of Bellingham, another sub-contractor.

Other Baker and Ford personnel on the job include P. J. McGonigal, office manager; Robert Baer, first aid and radio operator, and Bob Rexroth, concrete technician.

James L. McNamara has been acting resident engineer in charge of DEW-line construction for the Alaska District and Capt. Alfred J. Rabogliatti is assistant resident engineer. Walter Harris is project engineer at Nikolski. Art Cassler is the assistant project engineer.

Tiny camera gets picture of rock in 3-in. test hole

Corps of Engineers develops equipment to make complete photographic record in color of foundation geology. Camera used for the first time in the West at the John Day Dam site.

WHEN BIDS are called for the first-stage construction contract at John Day Dam, latest of the U. S. Army, Corps of Engineers, multipurpose projects on the Columbia River to be allotted starting funds, the interested contractors and their estimating engineers will have access to geological and foundation information obtained by a new method. Not only will the bidders have access to the usual diamond drill core logs showing geological formations for the entire foundation area of the $350,000,000 project, but also available will be a continuity of colored photographs taken inside the drill holes. This photographic continuity is possible through the use of the "NX" Bore Hole Camera recently developed by the Corps of Engineers.

LOWERING device at John Day location. The pay-out reel has 500 ft. of camera cable. Passing over the upper reel it automatically controls the electrical circuits for flash and camera drive.

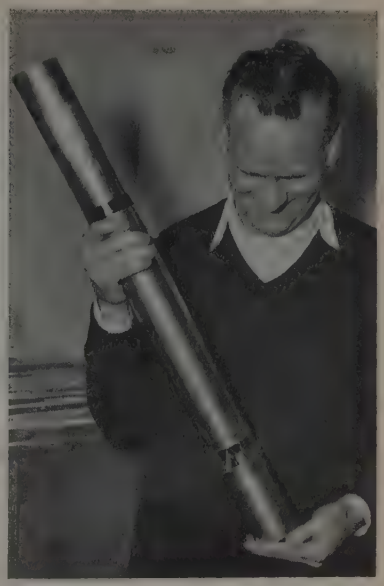
No consulting engineer would ever approve of a dam site location without first arriving at an accurate determination of the orientation (dip and strike) of faults, fractures, contacts, bedding plane and other bedrock features. Formulating such a geological picture to a depth of 150 ft. over a foundation area of 160 ac., such as John Day Dam will require, is a large order.

Rock imperfections

The most difficult foundation problems involved in the construction of concrete dams are those resulting from bedrock imperfections that tend to escape disclosure by ordinary exploratory means. Until recently the only economic subsurface exploratory tool available to geologists and foundation engineers was the small diameter diamond drill cores by means of which the site's foundation bedrock could be recovered for examination and testing. Various types of flaws, however, such as ruptures resulting from stresses, planes or zones of weakness related to chemical alterations and underground erosion, frequently camouflage themselves in boring cores. Obviously, detailed information of such weaknesses, their location, dimensions and structures, is of major importance to the designing engineers on any dam.

Contractors and engineers alike know all too well how these subsurface imperfections can be of sufficient magnitude to require costly design changes. Especially is this true when their existence is not discovered until after foundation excavation has been undertaken by the contractor.

To avoid these recognized hazards, exploratory small diameter drilling is usually supplemented by more reliable, but far more costly, exploratory methods such as shafts, tunnels and large diameter calyx drill holes into which an investigator may be lowered to physically examine the foundation rock structure.



WITH a diameter of 2¾ in. the complete camera mechanism weighs 33 lb. Note circular quartz window and the conical mirror which projects the image up to the film.

It was to meet the prohibitive cost of these expensive exploratory methods that the Engineering Research Associates, Division of Remington Rand, Inc., under the technical supervision and in accordance with plans and specifications furnished by the Geology Branch of the Department of the Army, Office of the Chief of Engineers, Corps of Engineers, developed the "NX" Bore Hole Camera. Under the direction of E. B. Burwell, Jr., now retired, and R. H. Nesbitt, present Chief of the Corps of Engineers Geology Branch, the camera was further perfected and adopted for field use by the preparation of a detailed operation instruction manual.

Costs greatly reduced

The high original cost of the pilot model of the camera paid off in quick order. It successfully brought to the surface at two test dam locations, information which would have been obtained only by the drilling of costly man-sized bore holes for subsurface physical examination. Substituted for these man-sized bore holes, which would have cost as high as $200 per lin. ft., were conventional 3-in. diamond drill core holes to be photographed by the "NX" Bore Hole Camera at an over-all cost of less than 50c per ft.

PROJECTOR OPERATED by Reed Anderson, geologist, provides a viewer for the 16 mm. film. The circular viewing screen is the same diameter as the bore hole. On another screen is shown a 3-in. length of bore hole at the same time.

To date only two of these bore hole cameras have been assembled and are now in use. At present, one is located at the Corps of Engineers' Ohio River Division Laboratories in Cincinnati, Ohio, where considerable experimental and modification work on the camera's lowering device and transportation equipment has been made. The second camera is located in the Corps of Engineers' Sacramento, California, District.

It is the Sacramento, California camera, along with the loan of an experienced geologist operator, Reed Anderson, that has been in use in the John Day Dam site area since early December 1957, photographing a pattern of 3-in. core boring holes, mostly in inundated river bottom locations.

Design features

Externally, the camera unit is a simple stainless steel tube 31½ in. long and 2¾ in. in diameter, with a circular quartz window not unlike a lighthouse window, located 5 in. above the lower end. Internally, its principal parts include an oil-damped compass which supports a hollow and truncated conical mirror. The location of the compass in the center of the truncated conical mirror makes it visible to the camera lens located directly above the mirror.

A high voltage circular flash tube midway between the cone mirror and the camera lens actuated by a current impulse controlled by the camera lowering gear simultaneously illuminates the boring and exposes the camera film to the bright mirror image.

Directly above the lens is a conventional 16 mm. moving picture camera with motor and spool drive synchronized by the pulsing current that actuates the flash tube. The camera is designed to make sixteen flash exposures per foot of boring. Thus, with a 1-in. section of drill hole exposed at each flash and with sixteen exposures per foot of boring, sufficient overlap from picture to picture for continuity is assured.

On the ground surface the camera is controlled by a lowering device (see illustration) which consists of a pay-out reel with a capacity of 500 ft. of camera cable. The camera cable, with a tensile strength of 2,700 lb., passes over a level-wind control geared to a 16-notch pulsing wheel and depth counter. The apparatus is hand-cranked with a gear drive to the cable pay-out reel for lowering and raising.

Attached to the lowering mechanism is a small power supply cabinet which transforms 117 volt a.c. to three d.c. circuits of 450, 50 and 50 volts respectively. The highest voltage is transformed to 15,000 volts in the flash tube of the camera. One 50-volt circuit is connected to the camera motor drive and synchronizing relay. The other 50-volt circuit provides the synchronizing impulses.

As a precaution to camera loss or damage by jamming within a bore hole, a dummy camera of the same weight and dimensions as the camera is lowered and retrieved several times before using the real camera. In actual operation, the camera pulsing wheel, being geared to the crank and gear drive of the cable reel and guide reel, the time interval between picture exposure is controlled by the speed at which the hand crank is turned. With the camera capacity being 25 ft. of 16-mm. film, more than 75 ft. of bore may be photographed continuously without reloading. During the John Day Dam site explorations, most of the bore holes were 150 ft. deep with a large percentage being beneath the water surface in the river bed. The bore hole camera functions perfectly, even in these water-filled bore holes.

Equally as unique as the camera from the standpoints of optics is the device developed to project the continuous and overlapping pictures obtained by the camera. This projector transforms the pea-sized doughnut-shaped image which the camera's cone mirror impresses on each film frame into a true-to-scale cylindrical image. This is a third-dimension picture projector in its truest sense. Each picture presents authentically the depth, orientation, and dimensions of every feature of the explored rock and the colored film discloses accurate visual information as to its composition, texture and soundness.

All rock features revealed

The geological advantages of this pictorial exploratory record, over rock cores, are principally that conjecture regarding core losses is eliminated and orientation (dip and strike) of faults, fractures, contacts, bedding planes and other structural features of the rock can be determined easily and accurately by the visibility of the camera compass needle recorded on each film frame.

While the replacement value of each "NX" Bore Hole Camera is set at $6,000 to $8,000, the two cameras in existence represent a far greater cost expenditure when research man-hours are taken into consideration. The economic and saving potentiality in drilling costs, however, more than justify this experimental expenditure.

At the Walla Walla District Office, soil and foundation specialists are overlooking no source of data in preparing this subsurface site picture for John Day Dam's planning and designing engineers. While the Corps of Engineers maintains a policy of not attempting to provide contractors with geological interpretations on possible excavation problems that may be encountered, Col. Myron E. Page, Jr., District Engineer at Walla Walla, has indicated that both the diamond drill core boring logs and the "NX" Bore Hole Camera finding films and analysis will be available to contractors and estimating engineers when invitations to bid on John Day Dam are released.

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Work peak reached at Scattergood

Construction work on the first unit of the Scattergood Steam Plant of the Los Angeles Department of Water and Power speeds toward completion. Sand, salt spray and ground water are the main problems.

THE 60% COMPLETED mark has been passed as over 500 men are at work on the Scattergood Steam Plant of the Los Angeles Department of Water & Power. Total estimated cost of the first two units, plus common facilities for an eventual four, is $60,000,000. The plant is located on a 57½-ac. site near El Segundo, Calif., in the city of Los Angeles and adjacent to the existing Hyperion Sewerage Treatment Plant.

The several contractors on the project, as well as the Department's own forces (which are doing about half of the total work) are faced with a variety of unusual problems and have come up with some interesting solutions: a "sand slinger" was used to dispose of excavated sand on the nearby beach; a three-stage wellpoint system was used to dewater the excavation; a rail-mounted gantry crane running on a 2,000-ft. trestle was used to place large precast pipe on the ocean floor; elaborate precautions are being taken to protect all structural steel from corrosive action of the salty air; a specialty contractor is building a 332-ft. high reinforced concrete chimney; and several short tunnels are being pushed through the sand with the use of partial shields jacked ahead hydraulically.

Excavation

Excavating over 3,000,000 cu. yd. of sand for the foundations of the plant began early in 1956. Contractor R. Hensler used two portable hopper loaders which greatly speeded the operation. A notch would simply be bulldozed into the bank, the loader inserted, and the sand bulldozed into the hopper. A wide conveyor belt carried the material from the bottom of the hopper to Cook Bros. bottom-dump trucks at the rate of ½ cu. yd. per sec.

At the disposal area on the beach a short distance away, the trucks dropped their loads onto the sand flinger, a series of conveyor belts discharging onto high-speed rubber-lagged drums which distributed the material by throwing it outward over an area of up to 100 ft. in radius.

Cooling water for the main steam condensers will be drawn from the ocean through a 12-ft. diameter submarine pipeline, eliminating the necessity of using Southern California's vital fresh water supply. The parallel discharge line is also 12 ft. in diameter but 380 ft. shorter than the 1,980-ft. intake line. Installation of the circulating lines has been completed by the Macco Corp. under a $3,026,000 contract.

The lines are made up of 12-ft. lengths of reinforced concrete pipe with rubber gasket joints produced by United Concrete Pipe Corp. Each line will terminate at a structure with a vertical riser reaching to about 15-ft. below the surface of the ocean. The longer line will have a riser 33 ft. high from a 48-ft. depth. Cooling water will be taken through one line, used in the condensing system of the steam plant, and discharged through the other line. The flow will be reversed periodically to control growth and remove marine life from the intake line.

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ODEL H 60 up to 7500-lb. batches*
CAPACITY: 200 *plus* TPH

ODEL H 50 up to 5000-lb. batches*
CAPACITY: 150 to 180 TPH

ODEL H 40 up to 4000-lb. batches*
CAPACITY: 120 to 150 TPH

ODEL H 20 up to 2000-lb. batches*
CAPACITY: 60 to 80 TPH

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CAPACITY: 45 to 60 TPH

depending upon weight of aggregate, dry-
ng conditions and job specifications.

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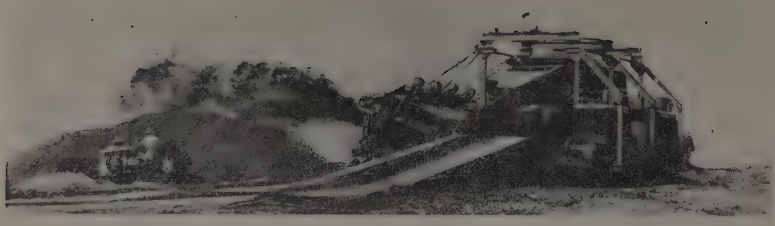
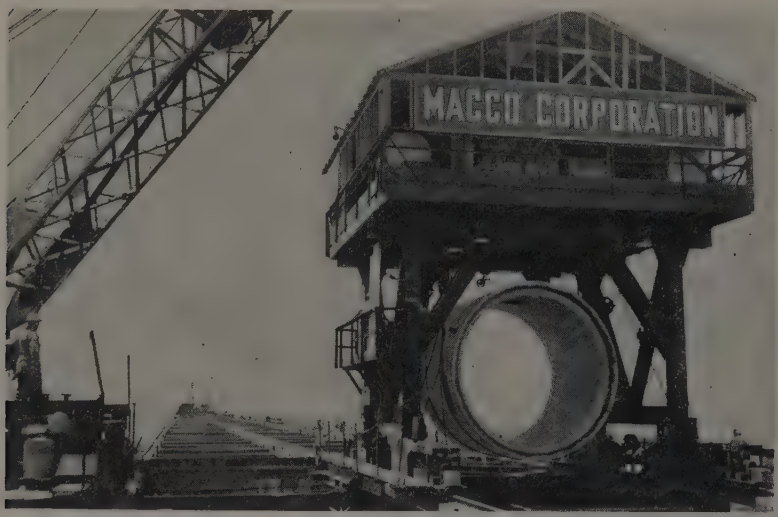
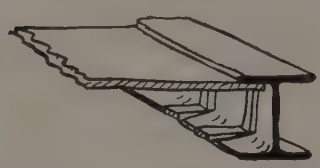


SAND SLINGER WAS used in early stages to help distribute excavated sand in the waste area on the nearby beach. Bottom-dump trucks dropped their loads on conveyors which discharged onto high-speed revolving drums which threw sand upwards of 100 ft.



GANTRY CRANE ON tracks was used by Macco Corp. to place precast concrete pipe sections on ocean floor for submarine cooling water lines. Temporary timber trestle was 2,000 ft. long.



EDITOR'S FIELD SKETCH shows forming method for concrete floor slabs. Wedges make both positioning and stripping easy.

Macco began construction by building a trestle about 2,000 ft. long extending into the ocean from the beach. It was constructed on timber piles except for the last 500 ft. which were steel. A gantry crane, specially designed and built by Macco for this type of work, traveled on rails while transporting and laying pipe. The gantry shifted from one side of the trestle to the other by means of a transfer table.

Interlocking steel sheet piling provided trench protection along the course of the dual pipeline on the beach and into the water beyond the surf line. Sea water stood in the trench at an average depth of 33 ft.

Trench excavation was accomplished with two Northwest 80 cranes equipped with clamshells. The cranes traveled the same rails as the gantry on specially designed carriages, one digging the intake trench and the other the discharge trench. The clamshells dumped their loads into an unusual "eductor." The eductor chuted to one side all material too large for its 10-in. dredge pump and pumped the balance through a steel line along the trestle to a point where backfilling was always complete up to the last 3 or 4 joints.

The gantry first lowered the pipe section into the water at the approximate position. A diver then descended and telephoned instructions to the crane operator who guided the new pipe section "home."

Macco personnel

Jack Christensen was project superintendent for Macco, assisted by Pete Christensen.

Macco recently completed a similar operation in connection with Southern California Edison's Huntington Beach Steam Plant.

The original ground line varied from about 75 ft. above sea level to 190 ft. Maximum cut was slightly over 90 ft. The material on which the structure is being erected is fine sand almost exclusively, with an allowable stress of about 7,500 psf. No piling was driven. All columns rest on spread footings. Everything below elevation plus 4 is waterproofed. Labyrinth type W rubber waterstops are being used for most of the waterproofing work.

Department forces began work in March of 1957 on the turbine-generator foundations, column footings, about 2,000 ft. of storm drains, and starter walls (about the first 6 ft. of the wall). Each of two turbine foundations which were poured required 1,800 cu. yd. of concrete.

Because of the irregular shape of the concrete work done by the Department's forces, all forms used were made on the job. A total of 12,500 cu. yd. of concrete have been poured so far for all foundations.

Corrosion problems

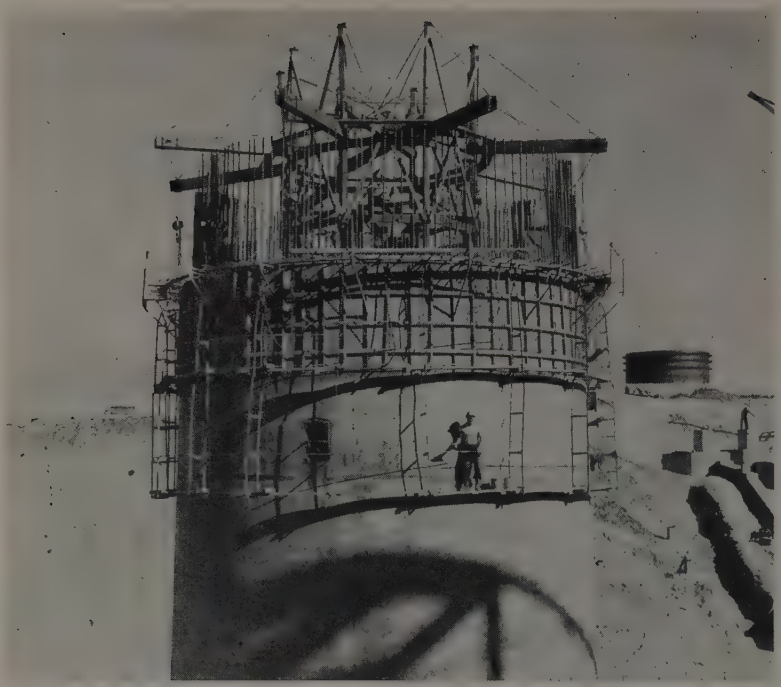
Because of the nearness to the ocean, all exposed steel is subjected to the highly corrosive action of salt spray and salt air. Steel members immersed in salt water receive a coating of Tarset, a coal tar epoxy material which is brushed on by a class of labor called "protective coating workers." Some of the pipes are wrapped with vinyl plastic. Structural steel receives a primer coat and three subsequent coats.

Most of the underground pipes are cast iron (which doesn't corrode), transite, heavily tarred corrugated steel pipe, or copper.

When storing pipe prior to use on the site, the interiors are subjected to just as much corrosive attack as the exteriors. To solve this problem, Department forces are using a material called Vapor Phase Inhibitor. Placed inside a pipe it fills it with a gas which forces the salt laden air out. The ends of the pipe are then sealed with a heavy paper cover.

Unusual tunneling method

The screen and pump chamber is separated from the plant proper by Vista del Mar (Highway 101). The two segments will be connected by a series of small tunnels now being driven under the high-



TAPERED CHIMNEY 332 ft. high is going up at the rate of one 7½-ft. lift per day. Sheet metal forms are used. Inside will be lined with 4½ in. of brick.

way. The tunnels are 5½ ft. and 8 ft. in diameter and vary in length from 50 ft. to 244 ft. Kemper Construction Co. is doing the tunneling work on a contract of $317,350. The method being used involves the use of a partial shield which is jacked through the sand hydraulically. This technique was described in detail in the March 1957 issue of WESTERN CONSTRUCTION in an article on the nearby Hyperion Tunnel. On that project Kemper achieved the remarkable one-day advance of 153 ft.

Concrete chimney

A 332-ft. high reinforced concrete chimney is being built by Custodis Construction Co., Inc., for $303,250. The spread footing for the chimney is a 77½-ft. octagon and is 9½ ft. deep. The inside diameter of the chimney is 33 ft. ½ in. at the bottom and 20 ft. at the top. The walls taper in thickness from 23 in. at the bottom to 6 in. at the top. When the concrete work is finished the inside of the chimney will be lined with 2 in. of insulation and 4½ in. of brick.

A 7½-ft. lift is made each day with sheet metal forms 7½ ft. high. The taper is changed by using wedge-shaped sheet metal inserts. Concrete (and men, one at a time) are brought to the top in a ¾-cu. yd. bucket from a hoist engine at the bottom. Top speed of the bucket is 500 ft. per min. The forms, scaffolding, and working platform are supported by bolts set into the previous lift.

Steel super structure

Structural steel was fabricated and is being erected by Bethlehem Pacific, on a contract of $1,385,000. Structural steel totals 3,550 tons.

The maximum height of the building is 137 ft. which means that all steel can be set in place from the ground by a Manitowoc crane with a 150-ft. boom. All field connections are made with high strength bolts tightened by air impact wrenches which impart a torque of 500-700-ft.-lb. Inspectors check about 30% of the bolts with torque wrenches.

Dewatering the site

Dewatering was handled by the John W. Stang Corp. The header manifold for the wellpoint system for the main plant was located at approximately elevation plus 4, the elevation of the ground water table. Excavation was required to elevation minus 12. The header perimeter was 1,600 ft. with 400 wellpoints used and four 8-in. Stang pumps. Two were driven by 40-hp. electric motors and two were gas-engine driven. The latter were placed in the line for standby purposes in the event of a power failure.

Because of the large area, a small supplementary system was required for a portion of the site to permit the excavation of the deep turbine footings. This system consisted of 420 ft. of header manifold with 100 wellpoints and two 8-in. Stang wellpoint pumps — one operating and one standby.

Five days of pumping

Installation of the dewatering equipment was made in February of 1957. About 5 days of pumping were required to reach the ultimate drawdown condition. Pumping continued on all of the wellpoint equipment until February of 1958, at which time concrete foundation work had been completed.

The contract for the construction of the screen and pump chamber on the opposite side of the highway from the main plant, was awarded to the H. C. Smith Construction Co. All wellpoint equipment was installed by Smith under Stang's supervision. (On the main plant, Stang supervised personnel of the Department of Water & Power during installation of the wellpoints.)

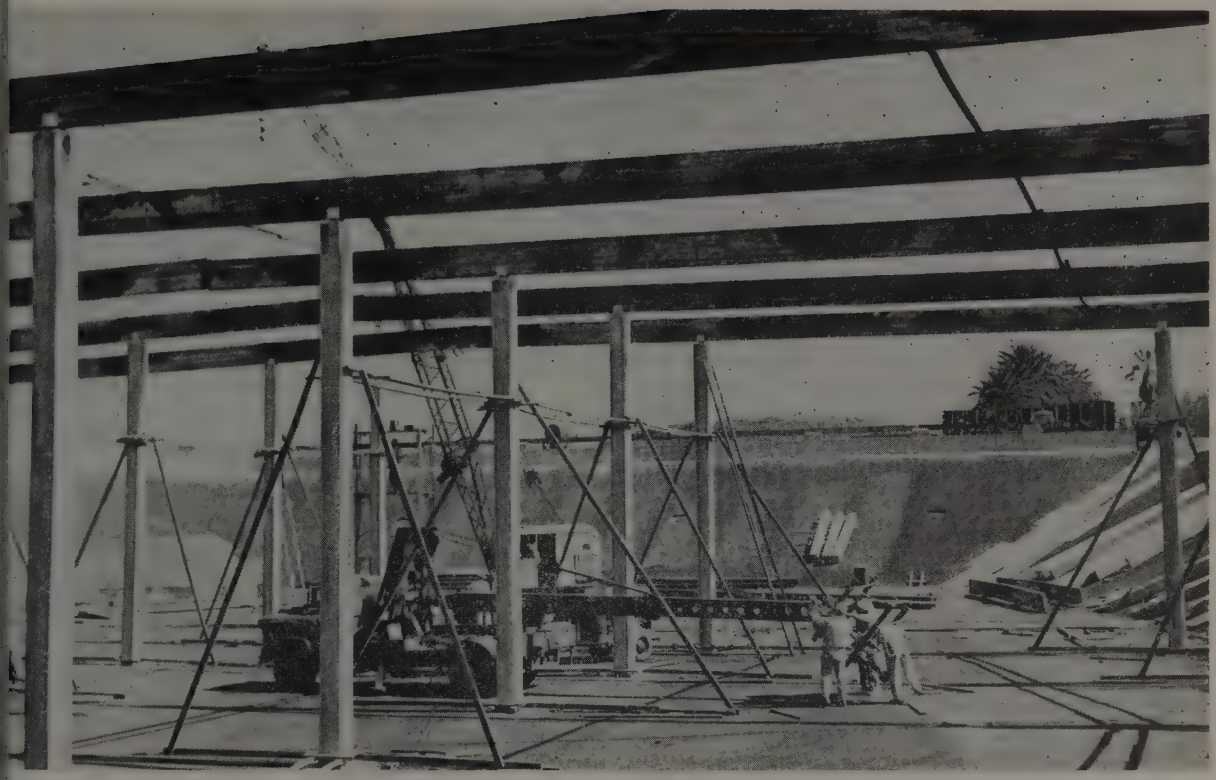
Excavation for the screen and pump chamber was required to an elevation of minus 27½ ft., with the requirement that the ground water level be lowered to a point 3 ft. below this elevation. A two-stage wellpoint installation was needed.

Assisted by the drawdown resulting from the previously installed main plant wellpoint system, it was possible to place the top header at elevation plus 1.5 with the second stage at minus 15. Top stage pumps were moved down to the second stage after the latter's installation.

Boil from pervious stratum

With this system the water level was lowered sufficiently to permit excavation to subgrade. However, due to the apparent presence of a tilted, highly pervious stratum, a high pressure zone existed below the excavation at an elevation of from minus 35 to minus 40. This stratum sloped near enough to the bottom of the excavation to cause the formation of a "boil" of considerable size. The boil was brought under control by a combination of wellpoints and two small diameter wells penetrating

(Continued on page 54)



PRECAST CONCRETE columns, manufactured by the contractor in a yard 40 mi. away, support long laminated timber girders. Men are preparing a platform on the end of the boom of a Pitman Hydra-Lift, from which roof connections are made.

New ideas lower reservoir costs

Reservoir designed to resist earthquake stresses has plywood and glulam roof and a lining utilizing a new porous asphalt mix.

By JEROME B. GILBERT

Assistant to
T. C. Binkley, Consulting Engineer
Palo Alto, Calif.

THE MIDDLEFIELD RESERVOIR, a 7,500,000-gal. structure now under construction for the Alameda County Water District contains a number of unusual features. The lining consists of a bottom impervious layer of asphalt-stabilized native material 8 in. thick, a middle layer of newly-designed porous asphaltic concrete and a top layer of prefabricated flexible asphalt panels. The roof structure is composed of precast concrete columns, laminated timber girders, and ⅜-in. thick plywood.

The reservoir is of the cut-and-fill type with 2:1 side slopes, and is located only 75 yd. from the Hayward Fault which meant that the possibility of relatively high lateral forces had to be considered in the design.

Five bids were submitted for construction ranging from $259,000 to $353,000. The engineer's estimate on the project was $258,400. These figures include the cost of a pumping plant which is estimated at approximately $20,000. Elmer J. Freethy of El Cerrito, Calif., was the low bidder and is currently constructing the reservoir. The cost of the roof, including columns, column footings and roof structure, is $1.14 per sq. ft. The cost of the three-layered lining is $0.97 per sq. ft. Cost evidence indicates that reservoirs of similar size and of conventional design have been costing upwards of 50% more than the cost of the Middlefield Reservoir.

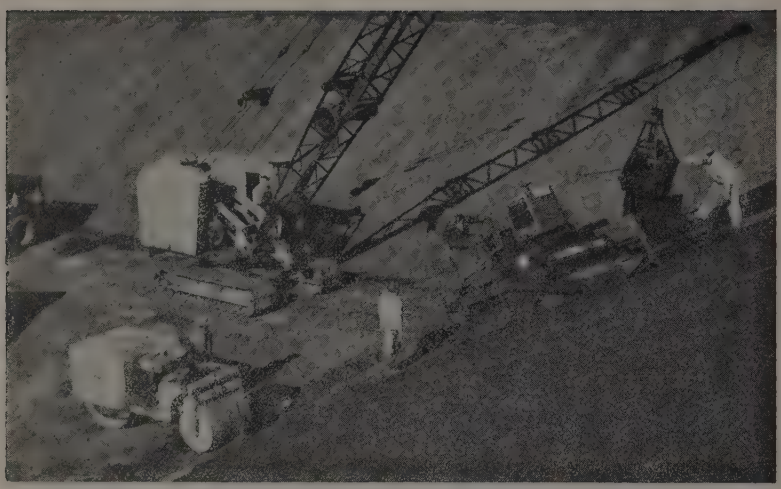
Excavation

About 28,000 cu. yd. of material was removed from the reservoir basin. Of this, 13,000 was compacted in the reservoir fills and the remaining was compacted in the steep 1½:1 slope adjacent to the site. Material was transported in scrapers and compacted with the sheepsfoot roller in 6-in. lifts to 90% of the maximum relative density obtainable for the material. One of the most difficult problems met was the trimming of the compacted fills. This was finally accomplished by a dozer operating downward from the top of the slopes. Efforts to trim by back dragging from the bottom only caused raveling of the surface.

Outlet works

The outlet works consist of a 24-in. line controlled by automatic valves, and a by-pass line located in a concrete valve pit west of the reservoir. One of these valves is unique in that it is designed to close when the velocity in the 24-in. line exceeds a certain predetermined rate. High velocity would occur in the event of an earthquake-caused line failure. Without such a safety mechanism a failure would result in property damage below the reservoir.

The line between the reservoir and the valve pit is housed in a



LAYING porous asphalt mix on the slope was done with a Barber-Greene paver, loaded by clamshell. Paver and tandem roller were cable-supported from top of slope.

TEXTURE of porous asphalt layer is indicated by comparison with cigaret pack.

6-ft. double rubber gasket concrete pipe tunnel. The portion of the tunnel inside the reservoir fill is encased in an envelope of stabilized base. This material was thoroughly compacted and forms a waterproof envelope that would have a tendency to seal the outlet line in the event of any earth movements.

Asphalt-stabilized base

The asphalt-stabilized base which forms the impervious bottom layer of the reservoir lining was constructed of native material excavated from the reservoir basin mixed with 6% SC2 liquid asphalt. Mixing was done with a traveling mixer. The contractor windrowed native material and after two mixing passes picked up the material and spread it around the top of the reservoir banks. A grader moved the material down the slopes. It was brought to the bottom of the slopes by back dragging with a dozer. In this manner, the slopes were covered in two 4-in. lifts. Each lift was compacted with an Essick vibratory roller; early attempts with a sheepsfoot roller were unsuccessful. The excellent results obtained with this layer can be attributed to thorough mixing and compaction and the good quality of the native sandy clay soil.

Porous asphalt layer

The porous asphaltic concrete layer is similar to that described as open-graded plant-mix surface in the standard specifications of the Division of Highways of the State of California. The Los Angeles Department of Water & Power has used it as the sole lining on a number of large storage reservoirs, and the East Bay Municipal Utility District has tested a variation of its own. (Western Construction, May 1957) This material can be placed on slopes as steep as 2:1 and its porosity can be made more than sufficient to handle leakage likely to come through the upper impervious layer. It will deform with settlement or earth movement and yet provide a sufficiently firm structural support for the top layer of prefabricated asphalt panels.

With the assistance of The Asphalt Institute, the following aggregate gradation was developed:

Sieve Size	% Passing
¾ in.	95-100
½ in.	80-90
⅜ in.	50-62
No. 4	20-35
No. 8	10-20
No. 16	5-15
No. 30	0-10
No. 50	0-5
No. 100	0-3
No. 200	0-3

This was a somewhat finer gradation than used by EBMUD. Tests showed that the percent of asphalt should be about 3.5.

The material was mixed in a nearby hot plant and transported to the site. Paving of the slopes was first tried with a spreader box towed from the top of the slopes. It proved difficult to control the thickness of the layer as well as achieve efficient production.

A Barber-Greene paver was then tried and was found capable of spreading a uniform layer which was relatively easy to control on the slope. The paver hopper was loaded from the bottom with a clamshell.

The surface was rolled by a 3½ to 5-ton tandem roller winched up the slope. It was difficult to properly time the rolling operation. The material cooled slowly and the period during which it could be effectively rolled occurred at times that inconvenienced construction operations. Experience with this work indicated that a less open mix could probably be placed more effectively. If the maximum aggregate size were limited to ½ in. and the gradation redesigned, a sufficiently porous mix could be obtained and workability improved.

The surface of the porous asphaltic concrete layer must be sufficiently smooth to place the prefabricated asphalt panel top lining. The coarseness of the Middlefield design mix made it difficult to obtain a perfectly smooth surface in all parts of the reservoir basin. The modification of the mix as mentioned above would tend to correct this.

Prefab asphalt panels

The waterproof membrane of the reservoir consists of ½-in. prefabricated asphalt panels. The top and bottom panel surfaces are 15-lb. asphalt saturated felt and the middle filler is a mixture of air-blown asphalt and asphalt-saturated fibers and inert filler. This provides a flexible and watertight lining material. To minimize the number of joints, the panels are 4 x 23 ft. in

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5. Can be quickly adjusted to dig at many angles regardless of position of truck.

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9. New winch takes power directly from transmission. Utilizes all speeds of transmission.

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PRECAST COLUMNS are set in place before prefab asphalt panels are laid. Notice how crane moves over porous asphalt layer on plywood without causing damage.

size, the largest that can be easily handled. Jointing is accomplished by butting the panels together and placing an 8-in. wide strip of the same material across the joint. This strip is sealed by a hot asphalt cement.

The panels are secured to all concrete structures by the use of percussion-driven studs. Along the parapet, they are bolted to provide a well-cinched anchor. At other structures, the studs are of the nail type with 2-in. washers. Extra strips of panel material were used to strengthen the panel at junctions with column footings and other interior concrete structures.

Columns and footings

After placing the stabilized base, the column footings were excavated and poured flush. Then, the porous asphalt concrete was paved over the footings. To erect the columns, square holes were cut through the porous asphaltic concrete to the top of the footing on which a steel surface plate was mounted.

The columns were precast in the contractor's yard and transported a distance of 42 mi. to the reservoir site. The 14 x 14-in. columns, which varied from 22 to 25 ft. in length, were erected upon the steel surface plate. The bottom connection was made by aligning four ¾-in. barrel nuts that extended from the bottom of the column. These were adjusted to plumb the column and then welded to the surface plate. The whole connection was grouted with non-shrink grout. The top column connection was made by adjusting a connection plate to the proper elevation by the use of a double nut connection and non-shrink grout. The crane used to erect the concrete columns and other heavy equipment which moved over the porous pavement traveled on a path of plywood panels that were placed in front of the equipment as it moved about. All erection of structural members was done before placing the prefabricated asphalt panels.

Glulam girders

The girders are 5 x 22 in. in section and are made of Douglas Fir. Waterproof glue for exterior use was used throughout. The beams ranged up to 80 ft. in length with the maximum clear span being 50 ft. between columns. Girder hinges were positioned to balance the negative moment over supports with the mid-span positive moment.

The girders as well as all other members of the roof were treated with copper salts to prevent the growth of fungus and the deterioration of the wood.

The girders weighed about 2,700 lb. and were erected by the same crane used to handle the columns. Connections were made by a workman standing in a safety platform supported on the end of a Pitman Hydra-Lift. This rig proved particularly useful on the reservoir slopes where the use of ladders would have been difficult.

Plywood roof

The 4 x 8-ft. plywood panels for the roof rested on 4 x 12-in. purlins which spanned the 20 ft. between girders. Stiffeners for the plywood surface were 2 x 4's at 24 in. on center. The edges of the plywood sheets were blocked and to conserve blocking the face grain of the plywood ran in the short direction.

All wood was treated with copper salts and all hardware including girder connections was galvanized. Joint hangers were used at end connections on both purlins and stiffeners. The ⅜-in. plywood surface proved quite sturdy under the weight of equipment used for erection. All erecting was done across the previously constructed roof, and the purlins were moved by the use of a roller-mounted counter-balanced crane made by the contractor which traveled across the surface of the roof.

Roof surface

A 3-ply cold process composition roof surface will be applied to the top of the plywood. No gravel or aggregate top surface will be used.

HOME-MADE RIG which runs on two sections of conveyor rollers is used by contractor to handle purlins and panels on the roof. Roof is erected entirely from the top.

COLUMNS rest on steel base plate set into foundation. A column is plumbed by adjusting the barrel nuts which bear against base plate. Then nuts are welded to plate.

A special extra asphalt coating of skid resistant material will be used in those areas of the roof that might be required to support traffic.

Acknowledgments

Engineer for the project is T. C. Binkley, Consulting Engineer, Palo Alto, Calif., assisted by William G. Dunn and the author. Structural Engineer is H. Neil Warren of Warren and Seibert, Palo Alto. Electrical Engineer for the project is C. Harold Johnson, San Jose, Calif.

M. P. Whitfield is general manager of the Alameda County Water District, owner of the reservoir. Senior engineer for the District is James Brewer, Jr.

Materials control and geology is being handled by Woodward, Clyde, Sherard and Associates of Oakland.

Jim Mathieson is superintendent for general contractor Elmer J. Freethy.

Subcontractor for the earthwork and asphalt lining is Norman Engineers, Concord. Prefabricated asphalt panels are supplied by Globe Linings, Inc., Long Beach, Calif., with installation by Malott and Peterson, Oakland.

Glued laminated girders are from Standard Structures in San Rafael, Calif.; plywood roof is from Berkeley Plywood, Berkeley, Calif., and wood treatment is by the J. H. Baxter Co., San Francisco.

STEAM PLANT

(Continued from page 44)

the pervious zone. The wellpoints represented a partial third stage installed at an elevation of about minus 24 ft.

The equipment required for this dewatering consisted of nine 10-in. Stang wellpoint pumps, some of which were used as standby. All the pumps were powered by engines using propane fuel. About 800 wellpoints were used and about 2,600 ft. of header manifold. The discharge lines for the two wellpoint installations were 12-in. and 16-in. steel pipe.

General statistics

The first 156,250-kw. unit is scheduled for completion in the fall of 1958 and the second in the fall of 1959. Two more will be completed later. The four units of the new plant will supply power enough for a city of 1,300,000 people. The turbine-generator units for 1 and 2 are being purchased from the General Electric Co. at a cost of $3,882,000 per unit. The generator stator for one unit will weigh 470,000 lb.

Boiler size and capacity

The boilers for the first two units are being purchased from the Combustion Engineering Co. at a cost of $2,872,000 per unit. Full load rating for these boilers is 1,200,000 lb. of steam per hr. at 1,850 p.s.i.g. and 1,000 deg. F. Fuel oil consumption at full load will be about 6,000 barrels per day per unit.

The cooling water required for the first four units will run over 500,000,000 gal. per day, which is 35% more than the average daily consumption of the entire city of Los Angeles.

Personnel

William S. Peterson is Chief Engineer and General Manager of the Los Angeles Department of Water & Power. Ivan L. Bateman is Chief Electrical Engineer and Assistant Manager. E. L. Kanause is Engineer of Design and Construction. J. F. Mariscal is Engineer of Construction, assisted by W. C. Mason, Project Engineer. Glen H. Meyer is Chief Field Engineer, H. M. Williams is Superintendent of Construction and Henry L. Bottoms is Chief Inspection Engineer.

Epoxies tested for dam conduits

Tests are under way to find the characteristics of various types of epoxy resins used as a surfacing material for eroded concrete.

By **WILLIAM R. CALLAWAY**

Assistant Manager
Hodges Chemicals Co.
Redwood City, Calif.

THE U. S. ARMY Corps of Engineers, with responsibility for the construction, operation and upkeep of many of the nation's major dams and waterways, maintains a continuing search for new methods and materials to solve its many maintenance problems. Under jurisdiction of the Sacramento District a contract of interest was completed in December 1957 at the Pine Flat Dam on the Kings River, Fresno County, Calif., by Hodges Chemicals Co., Redwood City.

Eleven separate test applications utilizing epoxy-based mastic films, adhesives, and mortars were applied to selected concrete surfaces of conduits, sluiceways and stream splitter block faces to determine the comparative resistance of these protective surfaces to the forces of deterioration.

In the past, eroded or broken concrete surfaces have been repaired by resurfacing with sand-cement mortar mixtures dry-packed into openings prepared by chipping back to solid concrete, usually to a depth of several inches. Edges of the openings are undercut to provide a mechanical lock to aid in tying the new mortar to the old concrete. Such repairs give reasonable service but they are no more resistant than the surface that deteriorated initially.

The epoxy resins derive their superiority over cements as binder agents from their outstanding adhesion and resistance to chemical attack and abrasion, plus the added characteristic of low shrink. The epoxies are thermo-setting compounds composed of 100% solids, 100% reactive resins and curing agents, and as applied in the Hodges Chemicals Co. formulas are entirely free from solvents or volatile diluents. The 100% solids films, mastics and adhesives may be transparent coatings consisting of reactive resins and curing agents alone, or the reactive materials may be combined with inert fillers and pigments yielding opaque surfaces of selected color. The mortar materials combine fine aggregates such as talc, sand or other inert mineral ingredients to provide protective surfaces of greater thickness and resistence to impacts.

Because the work areas were 380 ft. from the top of the dam, a temporary dock was constructed and all personnel, equipment, and material were moved by motorboat. Safety regulations included the use of hard hats in the work areas and life preservers while in the boat. Fire extinguishers were available but the absence of any solvents in the epoxy materials eliminates the chance of fire or explosion from this hazard. The natural updraft through the 300-ft. vent stack gave adequate ventilation. To prevent any possibility of the gates being raised while men are in the conduits the procedure at Pine Flat is that the control levers actuating the hydraulic gate mechanisms are kept padlocked, and the last man entering the conduits takes the key with him. For this contract one key was issued for the four locks to the two gates of each lower conduit and this key was kept in possession of the job superintendent during working hours.

Three types of treatment were made on the wall and invert, two on the splitter block and three special test patches were made on one of the lower conduits. Starting at the gate liner a 60-ft. length of the 5-ft. wide by 9-ft. high conduit was divided into three 20-ft. sections of 230 sq. ft. each. The north wall and the north half of the invert were sandblasted, dried and cleaned. Nearest the gate a transparent epoxy mastic was brushed on over the rough, eroded surface with a minimum thickness of 15 mils. Downstream, an epoxy resin adhesive binder was brushed on the wall and invert and immediately followed by a sand-cement mortar (2½ to 1) leveling course troweled over the tacky epoxy surface. On the third section the sand-cement mortar leveling course was applied directly to the sandblasted existing concrete and after 24 hours a seal coating of the epoxy mastic was

SPLITTER BLOCKS at the discharge end of the lower conduits deflect the water and throw it up and away from the toe of the dam. The blocks are subjected to great impact and abrasion. Epoxy adhesive was brushed on both upstream faces.

brushed over the cement mortar.

The three test patches were made in a localized area in which the fine aggregate and cement had washed away leaving coarse rounded aggregate exposed. Areas 16 in. square were chipped to a depth of 6 in. for Patches 1 and 2, and 3 in. for Patch 3. In Patch 1, epoxy adhesive was brushed on the cleaned base and edges of the chipped section and the cavity dry-packed with sand-cement mortar, 2½ to 1 ratio by volume. Patch 2 was dry-packed with the sand-cement mortar to within one inch of the surface and finished flush with epoxy mortar. Patch 3 was packed with epoxy mortar only, flush to the conduit surface.

The pyramidal splitter blocks at the discharge end of the conduits break the stream and throw it up and away from the toe of the dam. These splitters take the full force of the discharge and are subject to the greatest impact and abrasion. The worn and eroded splitter was first sandblasted and dried, and a coating of epoxy adhesive brushed over both upstream faces of the pyramid. This was followed immediately by a trowel coat of the sand-cement mortar to level out the rough surface and reshape the apex and edges of the block. The rough face of the splitter was finished with a brush-coat of the epoxy mastic film, 15 mil minimum. A trowel coat of epoxy mortar completed the surfacing of the north face.

The epoxy mortar only was applied to the north wall and one-half the invert for a distance of 60 ft. downstream from the gate liner. On the wall of another lower conduit a prime coat of adhesive was brushed over a sandblasted surface and the epoxy mortar troweled over to a thickness of ⅛ to ¼ in. The rougher invert surface was first leveled to the tops of the coarse aggregate with a filler layer of the epoxy mortar and this was topped with a finish layer of ⅛ to ¼ in. of the same material.

In an upper conduit a small irregular area had deteriorated due to gradual erosion and had been under surveillance for some time. An irregular mound of cement material about 5 in. long and a maximum of 1 in. high had adhered to the flat surface of the invert, forming a slight hump. On the immediate downstream side of this hump the surface of the invert had eroded irregularly to a depth of up to 1½ in. The cause is variously attributed to erosion, abrasion or cavitation, or combinations thereof.

This patch repair was made with the epoxy mortar. Water was diverted from the immediate area and the cavity was dried by air blast and flamed with a torch. The epoxy mortar was troweled into the dried cavity and flame-cured briefly with the torch.

Throughout the dam, drain gutters collect water that infiltrates the dam and carry it to the bottom sump from which it is pumped to the surface. Algae and organic growth collect on the walls of these gutters inhibiting the flow of water and presenting an unsightly appearance. These gutters have to be swept by hand, some every few days, others once a week.

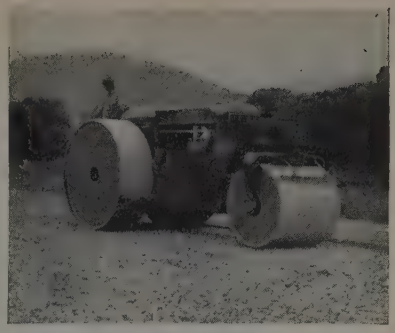
Operating personnel at the dam prepared 30-in.-long test areas on two locations by by-passing the water and cleaning and drying the gutter surfaces. Epoxy mastic containing white pigment was brushed over these surfaces and flamed with a torch to accelerate curing time. Purpose of this unscheduled application is to determine whether the glass-like surface of the epoxy film retards the accretion of algae or organic growth, and whether the smoother surface facilitates cleaning.

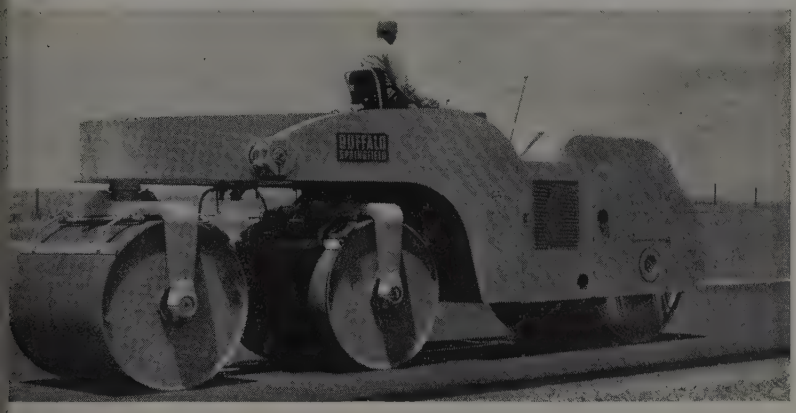
All of these test applications were applied by hand methods because of the limited size of each test area, and the variety of treatments desired for comparative purposes. Commercial applications of the epoxy film materials over large surface areas are made by spray technique utilizing the formulating applicator machine developed by the Hodges organization. This machine proportions the epoxy resins and curing agents, pumps and thoroughly mixes them immediately prior to spray-applying them on the target surface. Film materials of the 100% solids epoxy resins are also applied by this method to metal surfaces such as interior linings and exterior coatings of rail truck, processing and storage tanks, metal structures and equipment. Films bake-cured at 400 deg. F have outstanding chemical resistance to acids, alkalies, solvents and other corrosive agents.

The specifications for the test program at the Pine Flat Dam were developed under the Civil Design Section, Sacramento District, Corps of Engineers, J. D. Brooks, Chief. During development of the test program and the performance of the contract the District was represented by W. R. Mikesell and by E. J. Boyd, Jr., project coordinator.

Administration of the Pine Flat Dam is under the direction of Lyn Henson, Chief of the San Joaquin Valley Operations Office. Al Plummer is resident superintendent at the dam and Frank Fries heads the operating staff. Full cooperation was given the contractor by all Corps of Engineers personnel.

Hodges Chemicals Co. is headed by William C. Hodges. Contract operations at the dam were directed by William R. Callaway, and Richard E. Weber was in charge of the applications crew.





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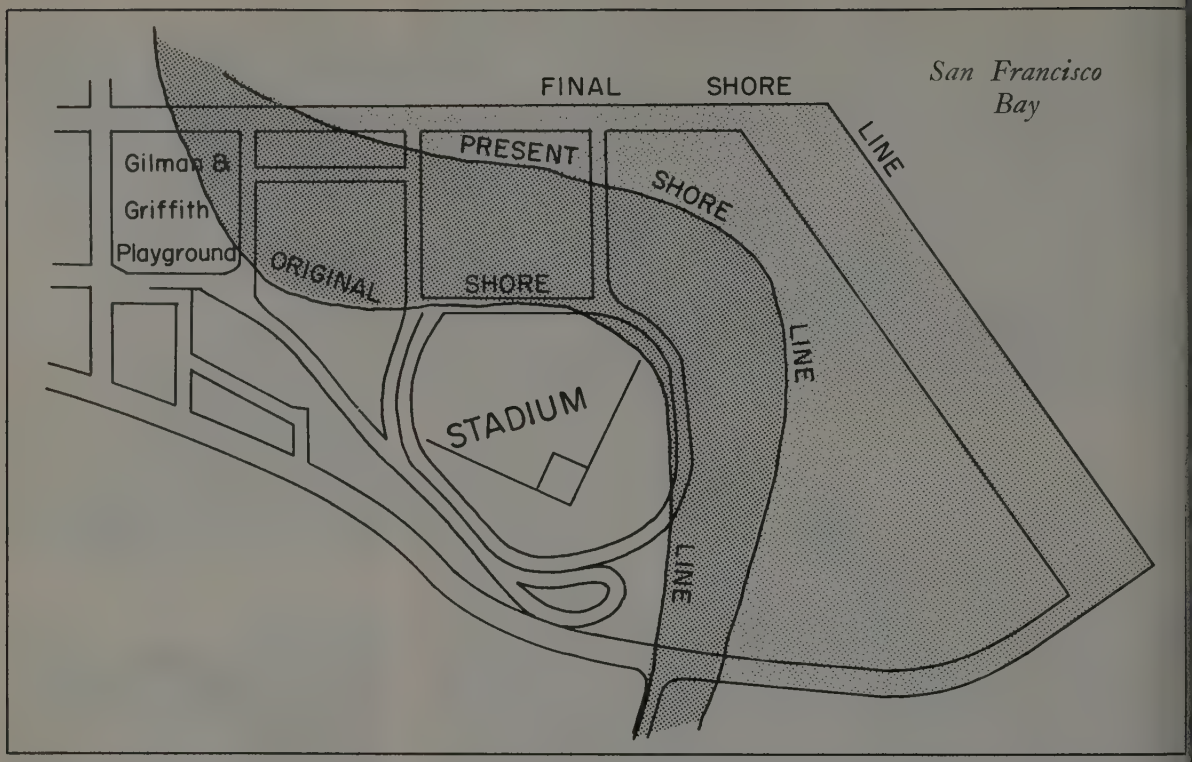

DRAWING shows how land will be reclaimed from the Bay to form a parking lot for 8,000 cars. About 500,000 cu. yd. have already been moved of a total of 2,000,000, changing the shore line as shown. The lot will settle several feet in 20 years as mud consolidates.

The West's first big league ball park

Some of the problems to be solved if the San Francisco Giants are to win a pennant concern earth-moving, tideland reclamation, and concrete prestressing.

EVEN THOUGH home plate is still 110 ft. underground and 15 ft. of water stands on most of the parking area, it looks almost certain that the San Francisco Giants will be playing baseball in a brand new stadium a year from now. The complicated financial obstacles have been successfully hurdled and the plans and specifications for building the prestressed concrete stadium and reclaiming 50 ac. of tidelands from San Francisco Bay are being rushed to completion. Only a legal objection raised by a group of anonymous property owners remains to be settled before construction work, already under way, can shift into high gear.

Persuading the New York Giants to move to San Francisco and arranging to have a modern ball park constructed was a job largely done by Mayor George Christopher and Supervisor Francis McCarty. A tremendous number of details had to be thrashed out with Horace Stoneham, president of the Giants.

The 77-ac. site is located at the extreme southeast corner of San Francisco. Carved out of the slope of a 300-ft. high hill, the stadium will be well protected from the wind and the city's famous fog.

The stadium is being financed by a $5,000,000 bond issue which the voters approved in 1954 to help induce a major league team to come to San Francisco, $2,000,000 from Continental Casualty and Continental Assurance Companies of Chicago, and $3,500,000 from Charles L. Harney, San Francisco contractor who owns much of the land and who will perform most of the construction work. For about $7,000,000 Harney will do the necessary excavation, build the stadium, and reclaim the 50 ac. from the Bay. This price is based on approximately $5,000,000 for the stadium and $1.00 per sq. ft. for the reclamation. A non-profit organization called San Francisco Stadium, Inc., has been organized to coordinate and supervise the financing, construction and administration of the stadium until the private loans have been paid off. The ultimate owner will be the Recreation and Park Commission of the City and County of San Francisco. The intricacies of the financing plan took 3 hr. to explain at a recent City Finance Committee meeting.

In April the City of San Francisco advertised for bids on the first of $2,800,000 worth of access roads (a total of 75,000 lin. ft. of 12-ft. wide lanes will be built) and $1,500,000 worth of sewerage to service the stadium. Part of the City's road network will encircle the parking area. Specifications state that the embankment for this roadway must progress at the same speed as the embankment for the parking area. This will eliminate the possibility of damage to the road embankment from the "mud wave" generated by the parking area embankment. It is also essen-

al that no mud is trapped be-
veen the two growing embank-
ents, which would be likely if
ne advanced ahead of the other.
or the roadways about 1,200,000
u. yd. is required, all of which
ill come from a single cut with
maximum depth of 200 ft.

Construction of the parking lot
ill require 2,000,000 cu. yd., of
hich 500,000 yd. have already been
oved by Charles L. Harney, Inc.
was largely due to the willing-
ss of the Harney organization to
ahead with the earthmoving
hen the project was still tentative
at will enable the stadium and
t to be ready for the 1959 season.
he construction firm of Mac-
onald, Young & Nelson, Inc., will
in with Harney for the construc-
on of the precast prestressed con-
ete stadium.

The parking lot will provide
ace for over 8,000 cars. At present
ost of it consists of an average
15 ft. of water standing on a
yer of soft mud from 10 to 90 ft.
ick. In the past, engineers have
llowed one of two general plans
reclaiming such land from San
ancisco Bay. A surcharge, or ex-
ss of excavated material is de-
sited on the mud to accelerate
consolidation, left in place for,
, six months, after which the ex-
ss is removed. On the stadium
oject, however, no time is avail-
le for extra earthmoving.

The other method involves de-
siting the material rather slowly,
a controlled manner, allowing
e mud to flow out from under-
ath. This results in a "mud
ve" which proceeds in advance
the fill. This roughly is the pro-
dure which will be followed.
owever, if the project is to be
mpleted for the start of the 1959
ason, dirt must be dropped in
e bay at the rate of some 40,000
yd. per day. This will create a
ge wave of displaced mud but
t all of the mud will have time
flow out from underneath the
w fill while it is being deposited.
e finished parking lot will there-
e be underlain by a layer of
terial not fully consolidated,
h considerable settlement antic-
ated.

There is no danger, though, that
lot will sink out of sight like
gar Allen Poe's House of Usher.
rough past experience, chiefly
h the Bayshore Freeway and the
ternational Airport, the settle-
nt can be fairly accurately pre-
ted. It will be about 1 ft. the
st year and a maximum of 4 ft.
the next 19 years. The settle-

NO GAME TODAY

THIS SWAMPY SCENE greets early fans at the site of the proposed stadium. Home plate is far underground and the parking area lies underneath 15 ft. of moisture.

THIS HILL is being torn down and dumped into the Bay by contractor Charles L. Harney to form the parking lot. Peak rate of earthmoving may hit 50,000 yd. per day.

ment will be greatest furthest from the original shore line, because the thickness of the mud layer varies as the distance from the shore. This means that the entire parking area will eventually tilt slightly, but the surface will remain nearly plane, and drainage will improve. There will be no local differential settlement which would crack pavement so no unusual maintenance expenses will be met.

The stadium will seat 45,000 and can be enlarged to 80,000. Willie Mays will have to hit the ball 420 ft. to get a home run in center field and 325 ft. down either foul line.

It will probably be the most comfortable stadium in the world. For instance, $100,000 will be spent to provide radiant heating in the floors under the seats. The upper deck will be supported by only 26 slender (10 in.) solid steel columns to minimize obstructions to the view. It will be the first baseball stadium to be constructed of prestressed concrete. This will enable the structural elements to be constructed and stockpiled while excavation is still under way. Erection of the structure is slated to begin in September of 1958, with completion 4 or 5 months later.

Not many months ago it was hoped that if the Giants were in contention for the pennant on July 1st this year, a crash program could be instituted to finish the stadium in time for the 1958 World Series. But this dream is rapidly fading as it has taken much longer than originally expected to unravel the financial, legal, and property entanglements.

The stadium was designed by architect John S. Bolles. Site engineer is E. Elmore Hutchison.

Sherman P. Duckel is Director of Public Works for the City and County of San Francisco. Reuben H. Owens is City Engineer, assisted by Clifford J. Geertz. Alfred Goldberg is coordinating engineer for the City on the stadium project.

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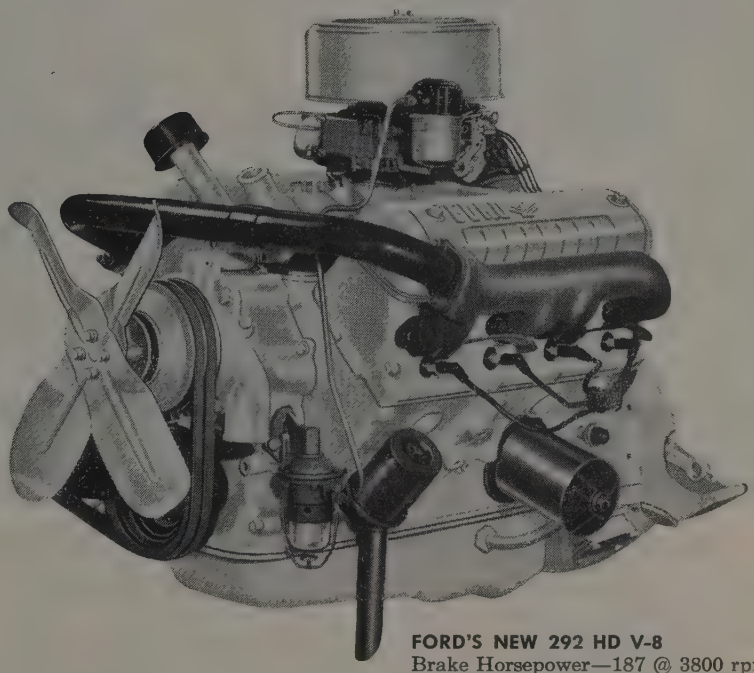

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Best water year since 1952 is predicted in this—

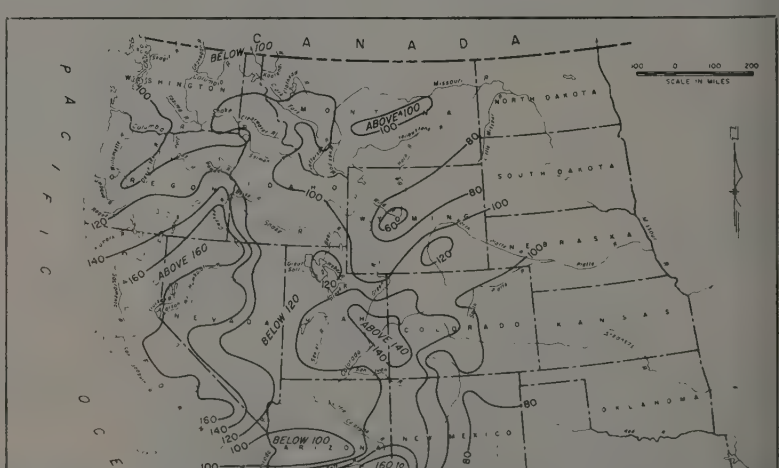
Runoff forecast for Western States

HOMER J. STOCKWELL
Fort Collins, Colorado
and
NORMAN S. HALL
Reno, Nevada
Snow Survey Supervisors,
Soil Conservation Service

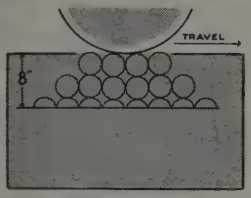
STREAMFLOW from snowmelt is expected to be at least normal for most streams over the West in 1958. In many streams in California, Nevada, southern Utah and southwestern Colorado runoff will be excessive. In only a limited area of the Wind River mountains of Wyoming, in northern Washington, and on the Verde River in Arizona is runoff expected to be materially less than normal.

Forecasts of 1958 irrigation water supplies and general water supply conditions in the West are based on April 1 measurements by the United States Department of Agriculture, Soil Conservation Service and many cooperating organizations[1] on about 1,300 snow courses and 100 soil moisture stations, the latter both on the watershed and in irrigated areas. The amount of storage in nearly 250 reservoirs also is considered in appraising the water supply outlook.

Violent storms during early April caused heavy damage in California. During this period the snowpack in the Sierra Nevada increased from about normal to near record proportions. Forecasts of flow by the California State Department of Water Resources for streams into the Central Valley of California now range from 150 to 180% of normal. As a result of these storms, April 1 snow surveys in California were delayed. The above forecasts are as of April 7, and may be sub-



1. 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 the 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.



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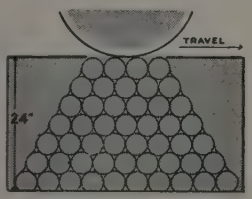

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ject to slight revision as delayed data arrives.

Major increases in snowpack during March were measured over a large area, including southern Utah, Arizona, and adjacent areas of Colorado. In these states covered by this general storm path, flow forecasts of 125 to 140% or more of normal are common.

In the Pacific Northwest streamflow forecasts range near average. Snowpack is close to normal. Soils in both irrigated and mountain areas are wet. Storage in reservoirs varies, being much above normal in Oregon and only slightly less than normal in the Columbia River.

On the watershed of the Upper Missouri in Montana and Wyoming, snowpack is near normal. Soils under the snow are wet. Soil moisture conditions in irrigated areas are reported as good. Near normal streamflow is expected in 1958.

The water supply outlook for irrigated areas of the North and South Platte rivers in Wyoming and Colorado is excellent. Streamflow from the mountain watershed probably will be near average. Excess streamflow from the 1957 snowmelt season allowed for an unusually good carryover of water supplies in both government and privately operated reservoirs.

For the first time since 1949, the water supply for the Rio Grande through Colorado, New Mexico, and Texas is expected to be reasonably adequate. Streamflow will range near normal.

Although some use of underground water will have to be continued in Arizona, the water supply outlook is best in recent years. Snow and rainfall has been excessive during March on the watersheds of the Salt, Gila, and Verde Rivers. Snowpack is now ranging from near normal to 400% of normal, depending on elevation.

The irrigation water supply outlook for the Great Basin area of Utah and Nevada is very good. Most snow courses in these states have measured water content between 100 to 140% normal. In Nevada, storage is 120% of normal.

The accompanying table shows the streamflow forecasts for some of the principal streams of the West for April-September 1958 period in acre feet and percent of normal. (The period 1938-52 is used for "normal.") These figures represent the approximate flow of streams that may be expected in the general area.

Western Runoff Forecasts for 1958

	Runoff 1,000 ac. ft.	April-Sept., incl. per cent of normal
RIO GRANDE		
South Fork at South Fork, Colo.	130	98
Rio Grande at Del Norte, Colo.	550	97
Conejos at Mogote, Colo.	180	81
Inflow to El Vado Reservoir	245	92
Rio Grande at Otowi Bridge, N. Mex.	825	96
Pecos River at Pecos, N. Mex.	50	80
PLATTE RIVER BASIN		
Poudre at Canon, Colo.	230	104
Clear Creek at Golden, Colo.	150	106
No. Platte at Saratoga, Wyo.	800	121
ARKANSAS RIVER BASIN		
Arkansas at Pueblo, Colo.	425	105
MISSOURI		
Yellowstone at Corwin Springs, Mont.	1,659	89
Wind River at Dubois, Wyo.	80	78
Madison nr. West Yellowstone, Mont.	173	88
Jefferson at Sappington, Mont.	1,119	106
Missouri at Fort Benton, Mont.	3,258	96
Clark Fork at Chance, Mont.	505	87
COLUMBIA BASIN		
Columbia at Birchbank, B. C.	37,500	94
Clark Fork nr. Plains, Mont.	10,239	95
Clark Fork at Cabinet Gorge, Mont.	11,712	96
Pend Oreille blw. Z Canyon, Mont.	13,820	93
Flathead nr. Polson, Mont.	5,651	85
So. Fork Flathead nr. Columbia Falls, Mont.	4,887	87
Columbia at The Dalles, Ore.	93,000	96
Umatilla at Pendleton, Ore.	165	99
Powder nr. Baker, Ore.	75	119
Owyhee Res., net inflow, Ore.	750	164
Deschutes at Benham Falls, Ore.	505	99
McKenzie nr. Vida, Ore.	1,280	107
Willamette at Salem, Ore.	4,800	110
COLORADO BASIN		
Salt at Intake, Ariz.	300*	173*
Gila at Virden, Ariz.	50*	224*
Green at Linwood, Utah	1,290	99
Colorado at Glenwood Springs, Colo.	1,400	90
Roaring Fork at Glenwood Springs, Colo.	775	100
San Juan at Rosa, N. Mex.	650	92
Animas at Durango, Colo.	775	148
Dolores at Dolores, Colo.	450	142
Colorado at Grand Canyon, Ariz.	11,300	112
Duchesne nr. Tabiona, Utah	122	100
GREAT BASIN		
E. Walker nr. Bridgeport, Calif.	96	131**
W. Walker nr. Coleville, Calif.	190	119***
Carson nr. Carson City, Nev.	294	153***
Humboldt at Palisade, Nev.	330	132***
Bear at Harer, Idaho	307	109
Weber nr. Oakley, Utah	138	108
Provo at Vivian Park, Utah	187	113
OREGON AND CALIFORNIA COASTAL[1]		
Upper Klamath Lake, net infl., Ore.	725	138
Rogue abv. Prospect, Ore.	335	105
No. Umpqua blw. Lake Creek, Ore.	170	104
Sacramento (Shasta Res. infl.), Calif.	3,650	150
Feather nr. Oroville, Calif.	3,650	163
Yuba nr. Smartville, Calif.	2,225	177
American at Fair Oaks, Calif.	2,710	180
Mokelumne nr. Mokelumne Hill, Calif.	840	161
Stanislaus blw. Melones Pwr. House, Calif.	1,280	156
Tuolumne abv. La Grange Dam, Calif.	1,975	148
Merced at Exchequer, Calif.	1,060	155
San Joaquin blw. Friant, Calif.	2,270	163
Kings River at Piedra, Calif.	2,275	171
Kaweah River nr. Three Rivers, Calif.	505	159
Tule River nr. Porterville, Calif.	102	182
Kern River nr. Bakersfield, Calif.	920	165

* April-May ** April-August *** April-July

1. Due to very adverse weather conditions which delayed certain key snow surveys for April 1, some of these forecasts for California streams are subject to possible revision, pending more complete snow surveys.

EARTHMOVING . . .

Ninth of a series—Elevating graders

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Construction Consultant
Saratoga, California

THE ELEVATING grader—oftentimes referred to as a belt loader—is an excavating and loading machine depending upon haulers, or other wheeled vehicles, for removing the material which it excavates. Its general features and operation are well known to all earthmovers, but many contractors have not familiarized themselves either with the machine and its economy, nor with the various manufacturers' catalogs.

Compared to other types of excavators, if job conditions are favorable for its use, the elevating grader has low operating cost, even when operating under conditions that reduce production below average.

As a digging and loading tool the elevating grader has its peculiar field, which is handling clay and loam in level to medium rolling country. It usually works well in sand and gravel which have been moistened to give cohesiveness; also in ripped hard materials, including shales. It is not well adapted for work in rugged country where the slopes are steep and abrupt.

The elevating grader is primarily a loading device and crew production is governed by this machine, for obviously no more soil can be moved by the haulers than can be taken out and loaded by the grader. It is a good producer, and on the whole very effective when appropriately used and operated within the range of its capabilities.

Various designs of elevating graders are available, with a wide range of sizes and capacities. For turning soil onto the belt, most designs use a disc plow, but one of the larger machines uses a blade 12½ ft. long. Discs range in diameter from 24 to 50 in.; belts from 25 to 32 ft. long, and 24 to 54 in. in width. Some of the newer designs have a high production and low unit cost potential for many jobs.

Like all other excavators discussed in this series of articles, contractors must make periodic load-cycle analysis of elevating grader performance to secure figures on maximum production and lowest unit costs.

The impact of cycle analysis on production is illustrated in the accompanying table. The information is arranged from data obtained on three highway jobs by the Production Cost Unit, Bureau of Public Roads. All jobs utilized 13-cu. yd. struck capacity bottom dump wagons. The samples were: 213 working hours; 5,647 loads; and 68,500 cu. yd. of earth excavation using 54-in. belt elevating graders.

productive time rate is 705 cu. yd. per hour. When all major delays (each of 15 min. or more) are excluded to show the net available working time production is 527 cu. yd. per hr. Job production for total shift time and overtime including all delays of weather, storms, etc., averages 321 cu. yd. per hr. or 31% of maximum casting rate. To match this rate would require a power shovel of considerable size.

These cycle analysis facts do not apply to elevating graders of other sizes, due to variations in size of bite (furrow cross section), operating speed, size of disc or cutting blade, size and number of haulers, job conditions, etc., but they are valuable as a basis for comparison.

The ease with which cycle analysis may be obtained was demonstrated by a chart appearing with the fifth article of the series (Dec. 1957). It showed the complete cycle broken down into proper elements. Similar forms for other types of excavators have been illustrated and described in other articles in this series and the reader is referred to them for arrangement and instructions.

To stay in the earthmoving game, contractors must know their own job production rates. To analyze elevating grader production an easily followed procedure is as follows (See December chart for general arrangement of a form):

1. Time each loading period.
2. Measure the length of run for each load. A measuring wheel is ideal for this use.
3. Note exchange time required for loaded hauler to move out of,

(Continued on page 82)

Cycle and Performance Analysis—54-in. Belt Elevating Grader

Item	Average
Loading time per load	0.71 min.
Exchange time of hauling units per load	0.16 min.
Turning time at end of furrow	1.06 min.
Loading distance per load	99 ft.
Cross section of bite	3.3 sq. ft.
Forward speed during loading	139 ft. per min. 1.58 mph.
Pay load—bottom dump hauler—13 cu. yd. struck capacity	12.1 cu. yd. 93% of rated capacity
Production per hour (Total available working time)	321 cu. yd.
Production per hour (Net available working time)	527 cu. yd.
Production per hour—productive time	705 cu. yd.
Production per hour—loading time	1,035 cu. yd.

The table represents a composite summary of a variety of job conditions and management practices, in materials ranging from "easy digging" in light bulky sandy soil to "hard digging" in ripped shale, with excavation totals obtained from cross sections.

Maximum average production (side casting) with no delays, loss of exchange time for the hauling units, turning time losses, etc., was 1,035 cu. yd. per hr. which is much less than some advertised production rates for some smaller machines. The elevating grader is really a high production machine, but contractors must learn to "job investigate" their own production rates, and not depend upon the claims of others that might be true for short periods of time.

When allowance is made for observed hauler exchanging and elevating grader turning time, the pro-

Heltzel Flex-Plane

UNITIZED BATCHING PLANTS to further speed set-up and dismantling time . . . to give you even greater on-the-job flexibility. The new Heltzel Unitized Plant—like these on a G. Toccalino & Son job in Detroit—is designed in three easy-to-handle sections that go together in minutes. This installation is set up as push-button drive-through for extra fast service. Batcher and scale unit is integral part of center section . . . a real time-saving innovation. (Note new Heltzel E-4 twin-batcher cement plant.)

2202

THE HELTZEL STEEL FORM AND IRO

PLANE COMBINATION FINISHER-FLOAT does two jobs in one, re- ng crew time to an absolute minimum. The combining ese two jobs is a natural—results in a better finish in r time. This new machine was thoroughly tested on al jobs last season. Contractors report 4000 feet of ot pavement was floated and finished in a normal day but two or three hand finishers required. Get the facts is profit maker before submitting too many quotations.

ngineering

ings you unitized batching, improved rms and a new way to finish concrete

Modern highway design demands top efficiency in highway construction machinery. Portable . . . versatile . . . automatic . . . *fast.*

That's why Heltzel Flex-Plane Engineering works to give you the most modern road-building equipment obtainable. Up-to-date engineering, for example, has produced a definite contractors' preference for Flex-Plane over all other makes. This preference is based, of course, on proved performance.

Find out now what Heltzel Flex-Plane Engineering can mean to you — call on actual users of Heltzel and Flex-Plane equipment, and prove to your own satisfaction that this is the *modern* equipment for modern highway construction.

HELTZEL DUAL DUTY FORMS, such as those shown in use on the Plattsburg SAC base, have been redesigned to assure fast setting and stripping with maximum strength-weight ratio. Sizes available to exactly suit your job requirements.

MPANY • Warren, Ohio

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Consulting engineers render an objection

OBJECTION to a state agency doing engineering work for a local county water district was expressed in a resolution passed by the board of directors of the Consulting Engineers Association of California. The resolution reads as follows:

WHEREAS the Department of Water Resources of the State of California was established primarily to accomplish design and supervision of works necessary for the State of California; and

WHEREAS the available information indicates that the State Legislature did not intend that State agency to perform services for public or private agencies other than the State; and

WHEREAS the Department of Water Resources has apparently undertaken to provide engineering services to Tuolumne County Water District No. 2; and

WHEREAS such engineering services at Tuolumne County Water District No. 2 are apparently to be provided at charges which will not cover the costs to the people of the State of California; and

WHEREAS existing private engineering firms are available to provide such engineering services; and

WHEREAS it is improper use of State tax funds for the benefit of a non-State agency; Therefore be it

RESOLVED, That the Consulting Engineers Association of California urge the Department of Water Resources, the Department of Public Works, and other State agencies to discontinue rendering engineering services to cities, county districts and other political subdivisions, in competition with engineers in private practice; and be it

RESOLVED further, That a copy of this resolution be sent to the Directors of the Department of Water Resources and the Department of Public Works, to the Governor, and to Legislators.

Bur. of Recl. program, if stepped up

DETAILS OF THE accelerated Reclamation construction program included by the President in his statement on measures to improve the national economic situation have been announced by Secretary of the Interior Fred Seaton.

An increase of $70,823,000 in the budget request for fiscal year 1959 is contemplated, including $45,823,000 for expediting construction now under way. This would increase the construction budget for the Bureau of Reclamation for the year starting next July 1 to $232,685,000. This includes planning money for both the Missouri River and Colorado River Storage projects and also for loans for small projects to be constructed by local irrigation districts or similar organizations.

The added funds, if appropriated by the Congress, will permit expedited construction on going work on the Trinity River division of the Central Valley Project in California, the Glen Canyon Dam on the Colorado River Storage Project in Arizona, and the Columbia Basin Project in Washington State as well as on the several other projects listed.

The revised program also contemplates that prime construction contracts may be let for Flaming Gorge Dam in Utah and Navajo Dam in New Mexico, other key storage structures of the Colorado River Storage Project.

GATES PRE-ASSEMBLED FOR BROWNLEE DAM

Size of the four tainter gates being built for Idaho Power's Brownlee Dam is shown in this photograph taken at Gate City Steel of Boise, fabricator of the structures. Each gate weighs 120 tons and is over 31 ft. wide. Including the trunnion, the arms are more than 50 ft. long.

The No. 933 TRAXCAVATOR is the only tool for us when we're working in tight corners"

HAT's the word from Deane L. Jensen of Long Con-truction Company, Inc., Billings, Montana. Operator L. Clark agrees. "It's a nice little rig. Handy for an perator because you can do anything with either hand. ou can operate the bucket with the right hand and ift with the left. Loading out of a bank, I've loaded high as 80 cubic yards an hour. I've backfilled in uildings in places so small you had to have the bucket ear up to turn around. Had it in places 24 feet square ith a wall all around."

In the pictures on this page you see Mr. Clark and s Cat No. 933 Traxcavator working on a parking lot, reet and driveways for the Fair Lane Shopping Center Billings. The "nice little rig" scoops out dirt for ading onto trucks, spreads gravel for street founda-on, dumps trash. 4,500 cubic yards of material were ought here by truck and spread by the No. 933. The axcavator sandwiched in this work with other con-ruction jobs in the area for Long Construction Co.

See a demonstration of the No. 933 right on *your* b. Call your Caterpillar Dealer today. And after the monstration, have him explain how his expert serv-e and factory-quality replacement parts will protect ur investment in Cat-built equipment.

terpillar Tractor Co., San Francisco, Cal.; Peoria, Ill., U.S.A.

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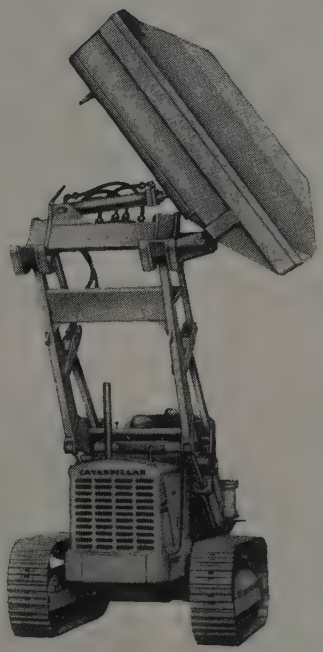

The No. 933 offers a standard bucket of 1 cu. yd. capacity. Also available, as a directly interchangeable attachment, is this new 1⅛ cu. yd. *Side Dump Bucket* which dumps to the left as well as forward.

CATERPILLAR

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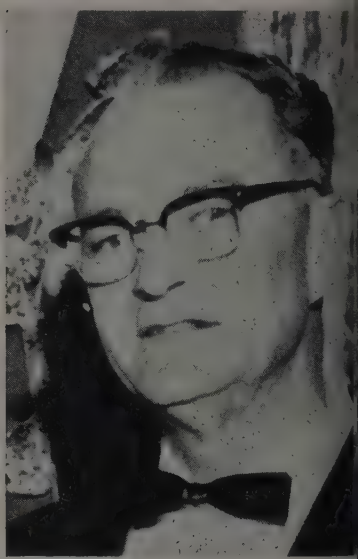
HARD-WORKING, LONG-LASTING LOADER VERSATILITY

John A. Kier dies

JOHN KIER, president of W. J. Kier Construction Co., and a contractor associated with the building of both Bonneville and the Grand Coulee Dams, died March 5 in a Beverly Hills hospital as a result of a heart attack.



He had been elected president of the Beavers at the Third Annual Meeting held last January.

Born in Kansas, he had lived in the Southern California area since 1911 and was graduated from Stanford University in 1931.

Washington highway engineering at high efficiency

ALTHOUGH WASHINGTON State's highway work budget has soared, the Washington State Highway Commission has gotten the work going with only a modest increase in personnel, according to W. A. Bugge, Director of Highways.

The highway department's personnel increased only 16% between 1949 and 1957, while contract awards increased by more than 280%.

Bugge pointed out that the small personnel increase has been made possible by use of advanced methods and equipment.

One important device used by the department is the electronic computer. This tool saves thousands of engineering man-hours yearly. The machine does many routine computing chores, leaving engineers free for more engineering work. Use of photogrammetry for laying out new roadways also saves time of many employees.

We get maximum production at lowest bit cost with TIMKEN® carbide insert bits

...Reports The Bridge Construction Corporation

MPROVING U.S. Highway 1 near Woolwich, Maine, required the re-oval of 152,000 cubic yards of gran-. In drilling blast holes to depths 20 feet, the Bridge Construction orporation, of Augusta, got maxi-um production at lowest bit cost r foot-of-hole with Timken® *car-de insert* bits.

Timken carbide insert bits permit-d increased drilling speed and fewer changes. They made it possible to ill out full increments of drill steel. They're your best bet, too, for drill-g in tough, abrasive ground. But rbide insert bits may not be best r every job.

When drilling in ordinary ground you'll find more economy when you use Timken *all steel multi-use* bits. With correct and controlled reconditioning, they give you the lowest cost per foot-of-hole when you can drill out full increments of drill steel.

Timken carbide inserts bits and all steel multi-use bits save time because they're interchangeable in the same thread series. They permit you to switch bits when the ground changes without changing drill steels. Both types of Timken bits have a special shoulder union that protects threads from drilling impact.

And Timken carbide and all steel multi-use bits are made from Timken fine alloy steel. We're the only American removable bit manufacturer that makes its own steel. It enables us to control quality every step of the way.

For the right bit for your particular job, call or write the Timken Rock Bit Engineering Service, The Timken Roller Bearing Company, Canton 6, Ohio. Cable address: "TIMROSCO".

Timken threaded all steel multi-use rock bit

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your best bet for the best bit for every job

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ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

ROAD ROUNDUP—As this year's construction season begins, there's little indication of any unusual activity in comparison with past years. However, the tempo of road construction seems to have picked up. The "last frontier" has a crying need for new roads, a fact that the federal government seems to have recognized only in recent years. Now, there's the realization that new roads are vital to the development of Alaska. Just as vital, of course, is the maintenance and improvement of "old roads" in the highway system. Most of the construction people I talked to indicated that in the next few months—and in the years to come—construction of roads will represent a larger-than-ever share of the total construction scheduled in the territory.

1958 PROGRAM — Recently, the Alaska Highway and Public Works Department announced its program of highway construction for 1958. In Alaska's Third Division alone, a total of $769,700 is scheduled for highway construction. In the Fourth Division, which has Fairbanks as its headquarters, total construction of $223,000 is planned. In addition, there are a large number of projects in the territory which were started last year or even earlier and are still not completed and will increase the total allocation. Overall program will amount to more than $20,000,000.

EMPLOYMENT PICTURE — We have been keeping a weather eye out for some sign of the "missile base construction program" which has been the subject of so many optimistic newspaper items originating in the territory. So far, we haven't seen the slightest sign of action on this front. The missile program represented the "big hope" of Alaskan employment and union officials who saw in the rumored program a means of absorbing the territory's intensified unemployment situation. So far, not a single man has benefited by the "missile base rumors." As a matter of fact, a steadily-increasing influx of job-seekers is creating a welfare and employment problem in the territory. Many union and employment officials blame the articles on missile construction for this gloomy and disheartening situation. As readers of this column will recall, the writer from the outset has cautioned construction men against coming to Alaska for employment on the strength of these stories.

PATTERN UP NORTH — The pattern of unemployment in Alaska is not vastly different from that prevalent in some areas of the United States. Unemployment seems to be increasing perceptibly. Latest figures issued by the Employment Security Commission indicate that nearly 18% of the total labor force in Alaska is currently unemployed. More than 9,000 Alaskans are seeking jobs. These figures, of course, are for that dark period immediately preceding the opening of the 1958 construction season. However, proof that unemployment in Alaska is increasing is evidenced by the fact that more than 1,000 additional persons are unemployed in Alaska this year as compared with the same period last year. We see no room for optimism in reviewing these glum statistics.

LABORING MAN'S PLIGHT?—What is the plight of the construction jobseeker in Alaska in view of the current "tight" conditions? Many an Alaskan laborer, for example, earned less than $1,000 in the past year. A few earned nothing by their own account. One typical laborer, who made $1,900 last year, said: "In order to get along, I had to borrow $1,000. A friend gave me a moose he shot. Another hunter gave me a caribou. A homesteader gave me some of his surplus cabbages, rather than let them freeze." Hardest hit by Alaska's unemployment are the laborers, carpenters, electricians, operating engineers, teamsters, painters and plumbers.

HOUSING CONSTRUCTION—A shot in the arm for Alaskan employment was the federal government's decision to go ahead with plans for putting up 260 units of housing at military bases near Anchorage and Fairbanks. Floyd S. Bryant, assistant secretary of defense, made this a somewhat bitter pill to swallow for some residents of Alaska by at the same time giving his views on housing conditions in Anchorage and Fairbanks. In a message to Alaska's Governor Mike Stepovich, Bryant said bluntly that much of the housing in the two cities is "unsafe, substandard, unsanitary and overpriced." This was too strong medicine to go without rebuttal from an Alaska source. M. G. Gebhart, executive director of the Alaska Housing Authority, replied: "In my opinion, Mr. Bryant's statements, although accurate enough for some components of the total housing supply, were too general in nature. In recent years there has been a conscientious effort on the part of the general public, federal and territorial agencies and cities to improve general housing conditions in Alaska."

LABOR REACTION — Reaction of labor circles to announcement of the government's military housing construction program was favorable. Labor officials, immediately afterward, urged the governor to use "build-up" methods of construction instead of pre-fabrications to increase the number of workers required for the jobs and thus help alleviate unemployment in Alaska's two largest cities. As this is written, no decision has been made as to what type of construction will be used.

FAIRBANKS CONSTRUCTION—Military construction in the vicinity of Fairbanks—most of it in the Ladd and Eielson Air Force base areas — will amount to more than $20,000,000 in 1958, the Army Engineer District has estimated. New projects are expected to account for $11,000,000 of this total with the remaining $9,000,000 allocated for projects on which construction was initiated previously. Projects planned for the Fairbanks area during the year include Nike facilities, a recreational fieldhouse, army family quarters and a hydrant refueling system.

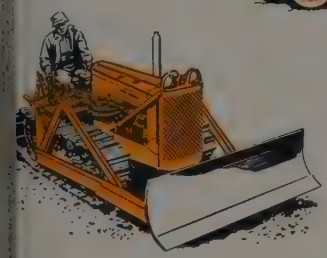
CONSTRUCTION NEWS NUGGETS—Alaska's White Alice communications network which provides telephone and telegraph facilities over some 3,000 mi. of the territory's interior, was dedicated on March 26 . . . Tempo of commercial construction in Anchorage is increasing, with $143,875 in building permits issued by the city in a recent week . . . The Alaska Railroad has launched a track improvement program which will cost in the vicinity of $1,000,000.

You CAN Do Something About OPERATING COSTS.....

The new John Deere "440" Industrial Crawler is ruggedly built inside and out to handle more than its share of a rough day's work.

Bring Them Down to Earth with JOHN DEERE Industrial Tractors and Equipment

New "440" Wheel Tractor is a highly mobile unit that can make your power dollars go farther than you thought possible.



The long-popular "420" Crawler is a busy, capable and economical tractor that continues to merit the praises of efficiency-minded industrial users.

Many optional features, including built-in power steering on wheel models and a new clutch-type direction reverser on all models, add to the versatility of John Deere Industrial Tractors. Equipped here with trencher is the "420" Wheel Tractor.

No need to point out here that there is no room for waste in construction methods. You know that.

But did you know that there's one sure way of cutting that waste? That you can pick up new savings daily on those earth-moving jobs? And also on moving, loading, and hauling of sand and gravel and other construction materials?

Well, you can—by investing in John Deere Industrial Power and Equipment, starting your savings with the initial purchase price and continuing them with lower fuel, maintenance, and servicing costs.

Here is big-capacity power with built-in economy—four John Deere Tractors, both wheel and crawlers—especially engineered for industrial work of all types, and all available with a complete line of matched working equipment.

Learn about the John Deere way of bringing operating cost down to earth from your John Deere Industrial Dealer. Ask for a free demonstration.

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HAWAII REPORT

ALAN GOODFADER
Honolulu, Hawaii

STRIKE EFFECTS — Hawaii's sugar strike is starting to affect construction on the neighbor islands, but on Oahu construction activity took up the slack in employment figures. Construction workers on Maui and Kauai have been laid off as a result of the strike, as have some 250 workers in the Hilo. Hawaii, Flintkote wallboard plant. On Oahu, however, new hirings raised total construction employment recently to 10,500. The additional men went on Capehart housing and Pali tunnel jobs.

VOLUME UP — And a report of the General Contractor's Assn. said that construction volume in the Islands stood at 11,100,000 in February, or $2,800,000 more than in the same month last year.

PROJECTS PLANNED — Keeping construction crews hopping will be millions of dollars' worth of governmental projects scheduled here and in the western Pacific. In the west, the Army expects to spend $14,000,000 in Okinawa, $3,000,000 in Formosa, $16,000,000 in Korea and $3,000,000 in Japan. The Navy plans $34,000,000 worth of construction in the Marianas, Southeast Asia and the Philippines.

MILITARY SPENDS — On Oahu, the Air Force announced that it plans to give the go-ahead in June for $9,600,000 worth of Capehart housing at Hickam Air Force Base. And the Army recently gave to J. M. Brock & Sons and Associates of Los Angeles a $4,250,000 contract to build 250 Capehart housing units at Ft. Shafter and Tripler Army Hospital. The news brought to $65,412,000 the total to be spent on six military housing projects here. Under way is a $21,500,000 project at Schofield Barracks. The Navy has called for bids on $18,000,000's worth of work at Barber's Point and other projects are scheduled at Kaneohe Marine Corps Air Station and at Pearl City.

MORE TO COME — Other military spending also is planned here this year. The Air Force says it has $1,000,000 for work on Hickam Field officers' quarters, fuel lines and a base chapel. Navy jobs scheduled include a $4,500,000 "classified" project at Pacific Fleet Headquarters, Makalapa; $4,392,000 at Wahiawa Radio Communications Center; $1,300,000 for crane tracks at Dry Dock 4 at Pearl Harbor, and $2,800,000 for aircraft parking and other facilities at Barber's Point Naval Air Station. And the Army Engineers expect to advertise in June for a $1,800,000 breakwater to be built at Kawaihae Harbor, Hawaii. Construction is supposed to start by July 1. The Engineers also have under consideration about $5,000,000 worth of projects and a $5,000,000 seawall project at Hilo, Hawaii.

SCHOOL CONSTRUCTION — Honolulu school construction also will continue to loom large on the construction horizon. The City has set tentative advertising dates for $4,159,000 worth of school construction, with bids being called for through July. Other City projects in the works include a $1,500,000 City jail, road construction and sewer work and $150,000 worth of street repaving.

ELECTRIC PLANT — Work started recently on $1,500,000 worth of construction of the Hawaiian Electric Co.'s new $9,250,000 Waiau power plant. E. E. Black, Ltd., is contractor. The plant will be Hawaii's first outdoor-type generator. Oct. 1, 1959, is scheduled as completion date.

DYNAMITE PLAN — The Territorial Board of Harbor Commissioners have approved "in principle" a Honolulu Construction and Draying Co. application for a $500,000 harbor and dynamite facility at Lono, Molokai. Final approval has been reserved until legal and financial arrangements are complete. HC&D wants to dredge a 20-ft. channel and construct shore facilities to handle sand, gravel and aggregate. It also would build a $40,000 dynamite magazine to handle the large shipments of explosives banned from Honolulu harbor.

CONSULTANT PICKED — The City Planning Commission of Honolulu recently picked a group of Honolulu and Mainland engineers and planners to do $90,000 worth of consultant work in con-

SAVE MONEY! SPEED ROAD JOBS!

GALION 503 MOTOR GRADER with VIBRATORY COMPACTOR

Now you can grade, spread material and compact fills and subbase courses with ONE machine. This combination of GALION Grader and Jackson Electric Vibratory Compactor easily, speedily and economically accomplishes most specified densities—often in one pass per lift. It leaves a smooth flat surface—no waves or "washboard" effect.

FOR SPOTS OTHERS CAN'T REACH

Individual compactor units may be detached and used as manually-guided, self-propelled compactors for confined areas.

Compactor power unit can be used as a lighting plant or for operation of small power tools.

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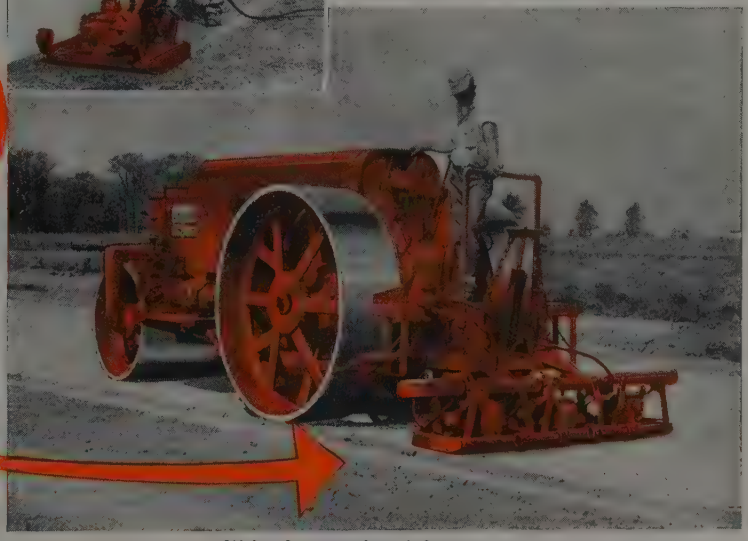
Either the "Chief" or "Warrior" model Roller with Vibratory Compactor gives you both static and dynamic compaction with ONE machine. You get the compressing action of massive roller weight plus the consolidating action of vibration (4200 three-ton blows per minute).

So effective is this double compaction effort that the most rigid Federal and State density specifications (including Proctor, Modified Proctor, and AASHO-T99-49) are often attained in ONE pass per lift.



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nection with a $237,000 Oahu-wide master planning job. In the group are Charles Bennett, former Los Angeles city planning director; George K. Houghtailing, former Honolulu city planning director; R. M. Towill, Honolulu planner and engineer, and the Honolulu planning and engineering firm of Belt and Collins. Before the choice was made, City officials agreed to a request by Governor Quinn to cooperate in planning activities with Territorial Planning Director Frank Lombardi. Lombardi came here from the San Francisco city planning department to be the first Territorial planning director.

HOPES FOR AID — The City of Honolulu hopes to get some $50,000 worth of emergency federal flood control aid as the result of Oahu's recent half-million-dollar flood. The money would be for repair of flood control structures in Oahu streams. And the flood may bring stricter City supervision of private drainage system construction. Mayor Neal Blaisdell said the flood revealed inadequacies which should be checked.

EARTHMOVING

(Continued from page 71)

and empty hauler to move into loading position.

4. Note time required for elevating grader to turn around at end of cut and get into loading position for next furrow.

5. Time all delays, both major and minor.

These facts should be collected for approximately 1 hr. each morning and afternoon under various job conditions for about two weeks. The figures can be classified according to job conditions and averaged. With such job data, poor, average, and good production rates can be charted. Once such basic information is available it is possible to begin the more important task of bringing and keeping production under control with consequent reduction in unit costs.

Such studies are the responsibility of the job planner and engineer. It is a part of the routine of work simplification and job control. The system is easily and quickly installed with necessary training of job personnel by construction consultants.

MacRae Brothers

SEATTLE, WASHINGTON

report on

4 of their 32 LORAINS

LORAIN teamwork means "progress plus" on this job . . . here they are, four Lorain Moto-Cranes, all in a row on this job, and all owned by MacRae Brothers, Seattle—who own 32 Lorains in total. These four are shown driving steel sheet piling with power hammers at the Bethlehem Steel Co., plant in Seattle, Washington. New Lorain features put jobs like these in high gear . . . 2-lever, "Joy-Stick" air power controls greatly reduce operator's effort; the job-proven "Shear-Ball" turntable mounting eliminates rollers and center pin—eliminates adjustment, maintenance, lubrication problems; and the new square-tubular-chord boom is stronger, longer—lighter.

Ask your Thew-Lorain Distributor about the on-the-spot Lorain parts and service facilities that have such an important plus value when you buy Lorain.

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Low bids and contract awards

ARIZONA

Copper State Construction Co. of Mesa submitted a low bid of $966,625 for 5.8 mi. of grading and surfacing on the Cordes Junction-Flagstaff Highway in Coconino County. A low bid of $915,272 was submitted by **Fisher Contracting Co.** of Phoenix for 4.7 mi. of grading and surfacing north of the Yavapai-Coconino County line in Coconino County. A low bid of $834,206 was submitted by **Southern Arizona Contracting Co.**, Tucson, for grading and surfacing the Benson-Steins Pass Highway in Cochise County.

CALIFORNIA

Vinnell Co., Inc. and **Vinnell Constructors**, Alhambra, received a $7,157,916 contract for 1.2 mi. of grading and paving an 8-lane and .5 mi. of 6-lane freeway in city and county of Los Angeles. **Judson, Pacific-Murphy Corp.**, Emeryville, submitted a low bid of $2,146,870 for reinforced concrete bridge and a steel superstructure, and grading and surfacing of approaches in Solano and Sacramento counties. A low bid of $3,135,130 was submitted by **J. A. Thompson & Son, Inc.**, of Inglewood for 3.1 mi. of grading and surfacing on 6-lane freeway and construction of 10 bridges and a pumping plant in city and county of San Bernardino. **Ball & Simpson** of Berkeley submitted a low bid of $1,814,527 for 2.8 mi. of grading and surfacing a 4-lane highway and installation of drainage facilities north of Laytonville in Mendocino County. **Madonna Construction Co.**, San Luis Obispo, received two contracts for road work in San Luis Obispo and Santa Barbara counties: $3,267,177 for 8 mi. of grading and surfacing Rte. 166 (Cuyama Hwy.) west of the Huasna River in San Luis Obispo and Santa Barbara counties and $506,321 for reconstructing 3 mi. of 4-lane expressway between Camp Fremont and Cuesta Overhead in San Luis Obispo County. **Fred S. Macomber**, Fresno, received a $1,307,000 contract for construction of student residence halls, Fresno State College. A low bid of $426,967 was submitted by **Pacific Bridge Co., Inc.**, San Francisco, for rehabilitation of Pier J-K at the Naval Air Station, North Island, San Diego. The **McNeil Construction Co.**, Los Angeles, builder of the first units of Loyola University, received a $800,000 contract for erection of the new library building, latest project on the Playa del Rey Campus. **L. B. Wells Construction Co.**, Visalia, received a $186,180 contract for grading and surfacing 6 mi. of highway in Tulare County.

COLORADO

Pioneer Construction Co., Pueblo, submitted a low bid of $253,802 for 7.4 mi. of grading, surfacing and structures south of Las Animas on S.H. #101, Bent County. **Peter Kiewit Sons' Co.**, Denver, submitted two low bids for road work in Arapahoe and Denver Counties. A low bid of $354,602 for grading and surfacing in city of Littleton, Arapahoe County, and $177,262 for street improvement in city and county of Denver. **Western Paving Construction Co.**, Denver, submitted a low bid of $167,029 for grading and surfacing in city and county of Denver. A low bid of $129,612 was submitted by **L. J. Hesser** of Greeley for 3.2 mi. of grading and surfacing between Johnstown and Milliken on State Highway No. 60 in Weld County. **Domenic Leone Construction Co.**, Trinidad, submitted a low bid of $463,342 for structures, grading and surfacing from west city limits of Swink-Northwest on S. H. No. 6 in Otero County. **Peter Kiewit Sons' Co.**, Denver, submitted a low bid of $204,456 for street improvement district No. 1033, city and county of Denver.

IDAHO

A $330,495 contract was received by **Fred Slate Co.**, Portland, Oregon, for 4.7 mi. of State Highway No. 51, Snake River - Rattlesnake Hill, in Elmore County. **Idaho Rock, Inc.** of Twin Falls submitted a low bid of $184,640 for production and stockpiling at the National Reactor Testing Station. **T & S Construction Co.** of Twin Falls received a $121,398 contract for construction of roadway, surface treatment and bridge on southwest Gooding Road in Gooding County. **Holmes Construction Co.**, Heyburn, received a $119,161 contract for reconditioning the roadbed and surfacing on 4.6 mi. of U. S. 30N, Georgetown Hill, in Bear Lake County.

NEVADA

Wells-Stewart Construction Co., Inc., Las Vegas, received a $2,074,530 contract for construction of a portion of the State Highway System, U. S. 91, northeast of Las Vegas in Clark County.

NEW MEXICO

Longenbaugh & Coe, Inc. of Albuquerque received a $1,895,324 contract for 5.3 mi. of grading and surfacing U. S. 66, east of Grants-West Road in Valencia County. A $787,630 contract was received by **Henry Thygesen & Co.** of Albuquerque for 15.9 mi. of grading and surfacing portions of US-60, west of Magdalena-West in Socorro County. **Skousen Construction Co.** and **D. D. Skousen & Son**, Albuquerque, received a $794,320 contract for 5.3 mi. of grading and surfacing the Cuba-North Road in Sandoval County. A $169,756 contract was received by **Trotz Construction Co.** of Albuquerque for 8.7 mi. of grading and surfacing Jct. SR-172 west toward Hagerman in Chaves County. **Wylie Brothers Contracting Co.**, Albuquerque, received a $364,963 contract for 9.3 mi. of grading and surfacing the Crownpoint-South road in McKinley County. A $95,306 contract was received by **Floyd Haake**, Santa Fe, for 4.9 mi. of grading and surfacing Jct. US-85—Colfax road in Colfax County.

OREGON

Roy L. Houck & Sons, & Roy L. Houck Sons Corp., Salem, submitted two low bids for roadwork in Marion and Linn Counties. A low bid of $1,262,693 for paving, N. Jefferson Jct., N. Albany Jct. on the Pacific Highway in Marion and Linn Counties, and $645,389 for paving the Salem By-Pass Section on the Pacific Highway in Marion County. **F. L. Somers** of Medford submitted a low bid of $542,665 for grading and paving the Wallowa Lake Highway, Minam-Rock Creek Section in Wallowa County. **Central Paving Co.**, Independence, submitted a low bid of $481,333 for structures, grading and paving the Tigard Interchange Unit, Harbor Drive-Washington County Line Section of the Pacific Highway in Multnomah County. **Babler Bros., Inc.**, Portland, submitted a low bid of $161,626 for bridge construction, Shogren Overcrossing of

(Continued on page 86)

ENGINEERS and CONTRACTORS

HEAD MEN at the Rocky Reach Project for Stone and Webster Engineering Corp., in charge of engineering and design on the job, are (left) *I. R. Kline*, resident engineer, and *John H. Boyd*, superintendent of construction. Located on the Columbia River near Wenatchee, Wash., the $200,000,000 hydroelectric project is being constructed by Rocky Reach Contractors, a joint venture comprised of L. E. Dixon Co., American Pipe & Construction Co., The Arundel Corp., Guy F. Atkinson Co., and The Hunkin-Conkey Construction Co. Contractor's chief engineer is *Michael Graves*.

C. Leslie Wheeler, president of the construction firm of Wheeler & Tempest, Salt Lake City, Utah, died recently. He was active in the development of the Intermountain Branch of Associated General Contractors and was its president during the year 1941.

* * *

Mark E. Thomas and **Aldo P. Savio,** co-partners in Mark Thomas & Co., civil engineers and surveyors of San Jose and Fremont, Calif., announce the association with them of three additional partners: **Harry F. Aumack, Jr., John E. Fleming,** and **Henry D. Gilbert.** Aumack and Fleming, both registered civil engineers, have been with the firm for four years, and Gilbert, a licensed land surveyor, ten years.

Several promotions have taken place in the Oregon State Highway Department. One of the top positions, assistant state highway engineer, was filled by **Philip M. Stephenson,** former bridge engineer, who replaced **W. W. Stiffler,** who retired on Dec. 31. **Ivan D. Merchant** moves up from assistant bridge engineer in charge of design, to bridge engineer.

In another change, **I. A. "Buck" DeFrance** was promoted from assistant maintenance engineer to maintenance engineer.

* * *

Fred W. Heldenfels, Jr., prominent Texas highway contractor, has been installed as 1958 president of The Associated General Contractors of America. **James W. Cawdrey,** a partner in the firm of Cawdrey & Vemo, Seattle, Wash., was sworn in as vice president, also for a one-year term.

* * *

Mihills O. C. Kelson, civil engineer of the North Pacific Division office of the Army Corps of Engineers, Portland, has been promoted to assistant chief of the Technical Engineering Branch. Kelson has been employed by the Division for more than eight years, prior to which he was in the engineering division of the Portland District office.

* * *

Arnold L. Henny, Portland, a civil engineer, has been named chief of the relocations section of the engineering division of the Portland District, Corps of Engineers. He succeeds **Glenn K. McKenzie,** recently retired. Before coming to the Corps in 1934, Henny was employed by the Bureau of Reclamation on the Minidoka project and at Denver, Colo.

* * *

New president of Mountain Pacific Chapter, Associated General Contractors, Seattle, is **Clifford F. Gailey,** construction superintendent of Diesel Oil Sales Co. To serve with him during 1958 are **J. A. Samuelson,** vice president of General Construction Co., as first vice president; **John Rumsey, Jr.,** manager of Rumsey & Co., as second vice president; and **Victor J. Scalzo** of Thomas Scalzo Co., as treasurer.

CALENDAR

May 8-10—Material Handling and Industrial Packaging Show, Great Western Exhibit Center, Los Angeles, Calif.

June 3-6—Western Association of State Highway Officials, annual conference, Hotel Utah, Salt Lake City, Utah.

June 11-14—National Society of Professional Engineers, annual meeting, Chase-Park Plaza Hotels, St. Louis, Mo.

June 15-18—Western Area Public Works Conference, San Diego, Calif.

June 22-28—American Society of Civil Engineers, national convention, Portland, Ore.

CONTRACT AWARDS

(Continued from page 84)

UPRR Section on the Columbia River Highway in Wasco County. **A. L. Harding, Inc.**, Stayton, submitted a low bid of $103,940 for grading and oiling Horse Ranch-Fort Rock Section of the Fort Rock Road in Lake County.

UTAH

A low bid of $980,729 was submitted by **Jack B. Parson Construction Co.**, Smithfield, for grading and surfacing 5.6 mi. northwesterly from Howell, westerly for 5.6 mi. on the Rattle Snake Pass, in Box Elder County. **Gibbons & Reed Co.** of Salt Lake City submitted a low bid of $219,699 for 1.6 mi. of grading and surfacing in city of Murray, Salt Lake County. **LeGrand Johnston Construction Co., Inc.**, Logan, submitted a low bid of $216,844 for grading and surfacing on 8.5 mi. beginning near the Utah-Idaho State Line easterly in Box Elder County. A low bid of $174,454 was submitted by **J. M. Sumsion & Sons**, Springville, for 8.8 mi. of grading and surfacing, beginning at the junction of State Road No. 47 and State Road No. 262 in San Juan County. **Schmidt Construction, Inc.**, of Arvada, Colo., submitted a low bid of $170,754 for 5.5 mi. of grading and surfacing near Pintura in Washington County. **L. A. Young Construction Co.** and **Vernal Sand & Gravel Co.**, Salt Lake City, submitted a low bid of $142,908 for 3.7 mi. of grading and surfacing north from U. S. 40 in Duchesne County. **Olson Construction Co.**, Salt Lake City, received a $2,954,267 contract for additions and alterations to Holy Cross Hospital in Salt Lake City.

WASHINGTON

Morrison-Knudsen Co., Inc. and **Rumsey & Co.**, Seattle, received a $2,987,878 contract for construction of Alaskan Way Viaduct in city of Seattle, King County. **Interstate Asphalt Co., Inc.**, Aberdeen, received a $129,546 contract for paving 7.3 mi. of Highway 9 in Clallam County. **Max J. Kuney Co.** of Spokane received a $558,859 contract for grading and surfacing east of Ritzville, Adams County. A $628,094 contract was received by **Pacific Sand & Gravel Co.**, Centralia, for grading and surfacing the new section of State Highway 9 from Capitol Lake to Mud Bay in Thurston County. **N. A. Degerstrom Co.**, Spokane, received a $871,000 contract for 3.6 mi. of grading and surfacing on St. Highway 3 in Spokane County. A $373,462 contract was received by **Wilder Construction Co.** of Bellingham for paving and new alignment of State Highway 1 from Stimson Road north to Portage Creek in Snohomish County. **Asphalt Paving and Engineering Co.**, Tacoma, received a $111,048 contract for grading and surfacing portions of State Highway 21, south of Bremerton in Kitsap and Mason Counties. **Lake City Gravel & Materials Inc.**, Seattle, received a $163,470 contract for approaches for new bridge at Lebam, Pacific County. **John E. Alexander Inc.**, Seattle, received a $127,673 contract for constructing new bridges across Raft River and Ten O'Clock Creek on State Highway 9 in Grays Harbor County.

WYOMING

Big Horn Construction Co. of Sheridan received two contracts for road work in Converse and Uinta counties: $709,351 for 6.4 mi. of grading, surfacing and other work on 6.4 mi. and misc. work on 14.6 mi., all 4-lane divided highway on the Glenrock-Douglas road in Converse County, and $568,962 for grading and surfacing 6.9 mi. of 4-lane divided highway on the Evanston-Ft. Bridger road from Ft. Bridger west in Uinta County. A $728,248 contract was received by **Summit Construction Co.**, Rapid City, South Dakota, for grading, surfacing and other work on 27.8 mi. of the Medicine Bow North Road in Carbon County. **Schmidt Construction Co.**, Arvada, Colo., received a $462,829 contract for 8.2 mi. of grading and surfacing on the Glenrock-Douglas road in Converse County. **Gilpatrick Construction Co., Inc.**, of Riverton, received a $175,211 contract for surfacing and other work on 15 mi. of the Woods Landing-Colorado state line road in Albany County. A $154,178 contract was received by **C. J. Abbott**, Contractor, Laramie, for 5.1 mi. of grading and surfacing on the Horse Creek-Farthing road in Laramie County. **McClellan & MacQueen, Inc.** of Worland received a $144,141 contract for construction of steel bridge over the Big Horn River on the Basin Gardens Road in Big Horn County. **Forgey Bros. Co.**, Casper, received a $127,220 contract for grading and surfacing on 9.4 mi. of the Cody-Clarksfork Road in Park County.

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SUPERVISING the jobs

KEY supervisors employed by Ross B. Hammond Co., contractor currently building a 6-story hospital for the Kaiser Foundation at Portland, Ore. L. to r.: *James Rivers,* carpenter foreman; *George Chester,* carpenter foreman; *William England,* job superintendent; *William J. Fehrenbacher,* concrete foreman; and *Clarence Schaad,* steel superintendent. Work on this $1,989,000 project got under way in February and Hammond aims to have it finished by April, 1959.

James Stephenson is supervising a $340,958 job for Oliver W. Scott & Son covering grading and surfacing near Garden Grove, Orange County, Calif. Grading foreman is **Bert Van Dyk** and foreman is **Perry Scott.** With June 30 set as the finish date, the job has been going since Jan. 17.

* * *

William Hilde as project manager has charge of Hilde Construction Co.'s recent award at $1,198,101 for 12.4 mi. of grading, gravel surfacing, and draining the Cascade-Ulm highway in Cascade County, Mont. Key men on the job which started Mar. 1 are **R. C. Blossom,** grading superintendent, and **Fay Ramsey,** gravel superintendent. Completion date will be some time in 1959.

Another Hilde job just starting, with **R. E. Buckingham** as superintendent, is for 11.3 mi. of grading and surfacing on the Hardin-Custer highway in Big Horn and Yellowstone counties in Montana. Hilde is doing this work at $148,828 and expects to finish by July 1.

* * *

Guy Haney and **Larry Mahan,** excavation and surfacing superintendent respectively, head the construction crew working for S. Birch, Inc., and S. Birch & Sons on 8.8 mi. of grading and surfacing soon starting on the Belt-Highwood highway in Cascade County, Mont. Assisting as foremen on this $292,055 award are **Carroll Graves, Larry Heilman,** and **Bill Ille.** According to Birch, they expect to have the job finished next September.

* * *

R. G. Wallace, project manager for Royden Construction Co., is in charge of a recent award to this contractor for grading and surfacing 5.4 mi. of the Tucson-Benson highway on U. S. Route 80 in Arizona. The $782,686 job started Jan. 6, with **W. W. Waetje** as concrete superintendent, and **J. G. Powers** as grade superintendent. Royden aims to have the work finished by mid-September.

* * *

Carl Jacobson, general superintendent, **E. O. Willis,** superintendent, and **Raymond Hershner,** office manager, are chief personnel on $390,949 job recently awarded Tanner Bros. Construction Co. for grading, surfacing, and construction of 2-span underpass structure on the Phoenix-Cordes Junction highway in Maricopa County, Ariz. Under construction since January, the job will probably end about mid-July.

* * *

Joe Bailo, superintendent, and **Henry W. Hewitt,** estimator, are key men employed by Elmer J. Freethy, successful bidder on construction of Adams Junior High School at Richmond, Calif. This $1,155,770 plant is earmarked for completion in March 1959. It has been under way since Jan. 6.

* * *

Alfred Parry, Ron McCleary, and **Dave Canham,** project superintendent, project engineer, and concrete superintendent, respectively, are important men on a contract which Donald M. Drake Co. has for earthwork, concrete lining and structures at the Columbia Basin Project in Washington. A $1,320,626 undertaking, the job started Dec. 1 and will probably be finished this coming October.

* * *

A. P. "Gus" Rapone, project manager, and **W. E. "Bill" Koerwitz,** project superintendent, are top men on Sierra Construction Co.'s contract for construction of buildings, grading, paving and miscellaneous at Jackass Flats, Mercury, Nev. Carpenter foremen are **Harold Jensen** and **Herman Wills.** Successfully bid at $2,058,325, the job got under way Dec. 2 and Sierra aims to have it finished Oct. 27.

* * *

Robert King, superintendent, **Theodore H. Willis,** project manager and engineer, and **Robert Walker,** estimator, are head men on construction of a high school gymnasium at Torrance, Calif. Crown Construction Co. was awarded the contract on a bid of $1,086,523,

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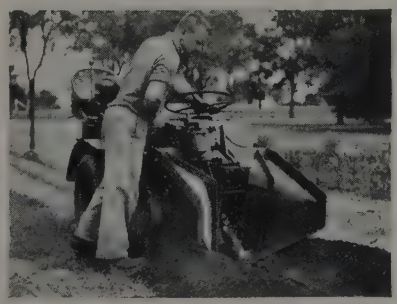

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started the work Dec. 2 and expects to have the structure complete about Sept. 1.

* * *

Stan Brown, general superintendent; **Don Peabody,** job superintendent, and **Frank Kelly,** project engineer, comprise top personnel for Barrett Construction Co., contractor who recently started work on the 134-bed addition to Sequoia Hospital in Redwood City, Calif. A $2,927,400 project, work commenced Jan. 6 and Barrett expects to see it finished by Jan. 1960.

* * *

Tommy Plemmons and **Vic Conte** are superintending a $1,890,000 contract for junior high school construction under way at Fresno, Calif., since last Dec. 23 by Bob Long Construction Co. Nov. 30 will probably see the job complete.

* * *

Melvin A. Johnson, project manager, and **Jay Grant** and **Norman F. Meyers,** superintendents for Grant Construction Co., are in charge of a $1,244,176 contract for grading, surfacing, and structures, Murphy's Corner to power line in Grant County, Wash. Job has been under way since last Oct. 29 and will probably be finished this coming September.

* * *

J. V. Beach is supervising a recent award to Silver State Construction Co. covering grading and surfacing in Ormsby County, Nev. Cement foreman on the $220,546 job is **R. Haukland.**

* * *

George Gustafson, project superintendent, heads the job of constructing a winery at Saratoga, Calif., contract for which is held by Williams & Burrows at $2,000,000. Other key men working here are **Ed DeRosa,** office manager; **Mike Farrell,** assistant superintendent; **Bill Johnson,** form detailer and carpenter foreman; **Jim Byrd,** carpenter foreman; and **Ed Veraza,** labor foreman. Job started Jan. 13, and according to **L. D. Clements,** general superintendent, it should be finished about Sept. 15.

* * *

Steven H. Smith, superintendent, and **Keith Curtis,** foreman, are head men working for Charles M. Smith who has a $133,000 contract for grading and surfacing the Buffalo-Tensleep route in Bighorn National Forest, Wyoming. Last Nov. 19 was the starting date on this job, and it is expected to be finished May 23.

Robert F. Sutton, project manager, and **W. M. Yancey,** project superintendent, with **L. D. Landreth** and **George G. Singer,** job superintendents, are key men for Oscar C. Holmes, Inc., and Thomas Construction Co., contractors on the $1,125,000 construction of culverts, bridges and streets in the city of Walnut Creek, Calif. Master mechanic on this project, which started last June and will be finished in May, is **G. D. Deal.**

* * *

Allen R. Bacon has been appointed project manager for Merritt-Chapman & Scott Corp., prime contractor for the Glen Canyon Project. Bacon has been associated with heavy construction for more than twenty years. A veteran of big dam and power plant construction all over the United States, he has worked on such Western projects as Albeni Falls

Dam and powerhouse, and Minidoka power plant in Idaho; Davis powerhouse in Arizona; Parker Dam in California; Elephant Butte power plant in New Mexico, and from 1953 to 1956 he was project manager for the $31,000,000 powerhouse construction at The Dalles, Ore. Prior to becoming project manager at Glen Canyon, he was general superintendent. Bacon replaces **Herbert S. Booth,** who was appointed assistant to **William Denny,** M-C&S vice president.

* * *

John Sorensen, project manager, **Woodson Brady,** superintendent, and **Glen Boodry,** engineer, are top men on C. H. Leavell & Co.'s recent award for construction of federal office building at Albuquerque, N. Mex. The concrete frame structure is being erected at a cost of $4,017,000 and is expected to be ready for occupancy in late 1959. Work began in March.

* * *

Nick Badovinus is job superintendent for Donald M. Drake Co., successful bidder at $2,681,004 for Esquatzel diversion canal construction in the Columbia Basin Project, Washington, covering earthwork, concrete lining and structures. Canal has 8-ft. bottom; lined section is 18.57 ft. deep, and up to 30 ft. deep in cuts. Other key contractor men are **H. O. Durston,** concrete superintendent; **Robert Kjelmyr,** job engineer; **Dan Patterson,** office engineer; **Floyd Hill,** excavating foreman, and **E. Butcher,** field accountant. With work under way since February, Drake figures to be finished in December.

* * *

B. F. Beckner, general supervisor, and **Tom Carrin,** project superintendent, are top men on construction of Lake Hughes boys camp at Los Angeles, Calif., a $1,455,000 undertaking by Beckner Construction Co. **S. G. Mitchell** is in charge of purchasing. Job started in February and is scheduled for completion in March 1959.

* * *

H. C. Ball, general superintendent; **R. J. Johnson,** chief estimator; **R. W. Bailey,** job manager; **T. E. Fellows,** chief engineer; **N. F. Barber,** project superintendent; and **G. Ross Davis,** job accountant, comprise the chief personnel for Twaits-Wittenberg Co., which recently won a $3,158,000 contract from the City of Long Beach, Calif. The project is 7-story 174,125-sq. ft. Public Safety Building. Work started in February.

* * *

B. V. Fredrickson, superintendent, assisted by **J. J. Gahan,** is in charge of a recent award to Fredrickson & Watson Construction Co. covering 5.1 mi. of grading and surfacing near Buellton on Route 80, Santa Barbara County, Calif. Other key men on the job, which started in February, are **Wayne Wilcoxon,** grade foreman, and **John Hudgens,** master mechanic.

* * *

O. P. Pope, project manager, **D. J. Westbrook,** general superintendent, **D. O. Hoyt,** excavation superintendent, and **W. R. Southworth,** concrete superintendent with **J. A. West,** project engineer, and **T. J. Hopper,** office manager, comprise the chief personnel for the joint venture of R. A. Westbrook, Inc., Morrison-Knudsen Inc., and H. Earl Parker, Inc., successful bidder for construction of operational apron extension and fueling system addition at Beale AFB, Marysville, Calif. This is a $1,881,315 contract just starting with construction expected to be finished the end of October.

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B. K. SOBY, vice president and secretary of the John Dieseth Co., Fergus Falls, Minn., amplifies the above by saying of his DW20s and other Caterpillar-built equipment: "They're good all-around machines with high production capacity. They're well-engineered down-to-earth machines that can be depended on to do a good economical job."

MR. SOBY has ample opportunity to prove out his preference for CAT earthmoving equipment on this highway improvement job—U. S. Highway 75 between Madison and Bellington, Minn. Working in hog-wallow type gumbo, two Cat DW20s with matching No. 456 Scrapers are pushloaded by a D9 equipped with No. 9S Bulldozer. The No. 456s are carrying 22 cu. yd. per load on hauls from ¼ to ½ mi. The job involves moving 623,000 cu.yd. —50,000 yd. borrow and the balance general excavation. A Cat No. 12 Motor Grader maintains scraper haul roads.

Now a new DW20 (Series F) Tractor is available. It features a SUPER-TURBO Engine that provides 320 HP (maximum output) . . . 28% torque rise . . . top speed of 35.8 MPH!

The SUPER-TURBO incorporates a new concept in diesel engine turbocharging—an air induction system unique in earthmoving machines . . . and another Caterpillar first. This system allows use of more of the Turbocharger's potential than was possible before. Results: twice as much torque rise, higher horsepower, better acceleration and gradeability. But more important, faster cycles, greater production and more profit—*for you.*

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SUPER-TURBO ENGINE
—First in the Industry
—First in Performance

. . . for more details, circle No. 48 on Reader Service Postcard

Robert A. Read is superintending a Read Construction Co. award which got under way in March, and covers grading, surfacing and three concrete culvert passes on 2.3 mi. of the Thermopolis-Shoshone road in Hot Springs County, Wyo. Construction foreman on the $424,834 job is **Robert Alexander.** Job will be finished in August.

Just finishing up on a short job in Goshen County for this contractor is **James F. Read,** superintendent. This was grading and surfacing a portion of the Fort Laramie-Fort Laramie National Monument road.

Ralph J. Jones, project manager for Morrison-Knudsen Co., Inc., is in charge of a recent contract awarded M-K for 4½-mi. 4-lane construction of portion of state highway in the vicinity of Wadsworth, Washoe County, Nev. Grade superintendent is **Dean Straw,** and the master mechanic is **Robert Boyer. John Cotner** is office manager. Earmarked for finish in October, work commenced here Feb. 12.

* * *

Everett Baughman, superintendent, is in charge of construction of 9-story addition to existing office building at the Civic Center in San Francisco. **J. Lewellen** is timekeeper. Rothschild, Raffin & Weirick got the contract on a low bid of $1,199,200. A year-long project, work started in February.

* * *

Harry Varischetti (Isbell Construction Co.) has been appointed project manager for the $7,325,011 contract recently awarded to Isbell Construction Co., Granite Construction Co., Gordon H. Ball & Gordon H. Ball, Inc., for highway work in Nevada County, Calif. Project superintendents chosen are **Ed Dempsey** (Isbell Const.), and **Al Manducci** (Gordon H. Ball).

* * *

Carl L. Croft, project manager, and **Kenneth W. Bradshaw,** general superintendent, are in charge of a recent award to I. L. Croft & Son, Inc., for grading and surfacing 4.9 mi. on Whitney Portal road beginning 7 mi. west of Lone Pine, Calif. Master mechanic for this $316,236 job is **Fred S. Croft; Charles Arter** is foreman, and **Harlan Gray,** blasting foreman. Work has been under way since last Nov. 4 and is expected to be complete in August.

* * *

Lewis N. Spencer, project manager, and **William M. McMurren,** project engineer, were recently appointed by Morrison-Knudsen Co., Inc., and Macco Corporation to head construction of 14.26-mi. pipeline of 96-in. round welded steel pipe with mortar covering exterior and interior. This joint venture was awarded the contract by Metropolitan Water District of Southern California on a low bid of $12,089,596. Other key personnel on the job, which started in December, earmarked for March 1959 completion, are **James A. Hobson,** office manager; **Harlan "Shorty" Pearce,** tunnel superintendent, and **J. H. Martin, Jr.,** pipe coordinator.

* * *

John Tryon, superintendent, and **Guy McGee,** engineer, are in charge of a road job in Gallatin County, Mont., for the contracting firm of S. S. Mullen, Inc., recently awarded the job on a bid of $299,240. Work, which has been going since Mar. 1 and probably be finished Aug. 1, consists of 6.2 mi. of grading and surfacing on the Gallatin Gateway —south highway.

* * *

Dick Chafin, general superintendent; **Paul Shaw,** project engineer; **Robert Pate,** master mechan-

ic; **Otis Luster,** superintendent — paving; and **Les Johnson,** superintendent — structures, comprise Madonna Construction Co.'s top men on a 9.9-mi. grading and surfacing project between Rancho Santa Fe and Escondido in San Diego County, Calif. A year long job, work on the $1,052,253 contract started last December.

* * *

Henry E. McCutcheon, Jr., superintendent, and **George H. Kizer,** job engineer, together with **James Greig,** carpenter foreman, are key men on a job under way since November by contractor C. K. Moseman at San Diego, Calif. A $1,245,891 undertaking, work consists of grading, surfacing, and construction of 8 bridges and widening of another span. Jan. 1959 is marked for the finish of the job.

* * *

W. R. Brown is supervising a $359,869 recent award to E. J. Rippy & Sons for grading, structures and surfacing between Fort Lewis and Breen, La Plata County, Colo. Work is expected to be finished in July.

* * *

Bill Cole, superintendent, is aided by **Guy Scott, W. McKenzie,** and **Sherm Ward,** all assistant superintendents, in carrying forward a highway job recently awarded to Peter Kiewit Sons' Co. on a low bid of $1,056,025. The work is located on the Oregon Coast Highway north from Brookings, and covers 4.1 mi. of grading, surfacing, and structures. Office manager is **Bill Allen.** Another key man is **Eddie Thiel,** master mechanic. Started in January, the work will extend probably through spring.

* * *

J. A. McCarty, superintendent for Heiskell Construction Co., is supervising a $214,841 contract for grading and surfacing south of Payson in Tonto National Forest in Gila County, Ariz. Assisting as grade foreman is **Albert R. Richardson.** Work started in late December and will end about June 1.

* * *

James Abshire as general superintendent is in charge of a $283,949 project of Gardner Construction Co. for 2.1 mi. of grading, structures, and surfacing north and south of Carbondale on S.H. 133 in Garfield County, Colo. Structure superintendent is **Bill Hasse,** while **Clifford Gray** is excavation foreman. Started last Dec. 1, the work will probably be finished by June 1.

* * *

J. C. Moore has been named job superintendent for the 7-story courthouse and jail to be constructed at San Diego, Calif., according to **Marlin C. Young,** vice president and general manager of F. E. Young Construction Co., joint venturer with Morrison-Knudsen Co., Inc., on the construction. Construction manager for this $8,866,667 contract is **Gary Hargrove.** Set for March 1961 completion, the job got under way March 24.

* * *

Ronold Hadfield, project manager for Jack B. Parson Construction Co., is in charge of this contractor's $972,725 contract for construction of a plant-mix, bituminous surfaced road in Box Elder County, Utah. Foremen on the job are **Doe Hodges,** grade; **Lamar Jones,** fence; **W. J. Parson,** pipe. **Arnold Auger** is equipment mechanic. With November the target date, the job started Mar. 15. Grade, fence and pipe work is under way now and approximately 8,000 cu. yd. is being moved in an 8-hr. shift. With the coming of improved weather, two shifts will be employed.

CONSTRUCTION BRIEFS

Gantries move prestressed girders for bridge at Air Force Academy

WHEN A. S. Horner Construction Company, Denver, was awarded a contract recently for the construction of four highway bridges and two railroad bridges within the area of the Air Force Academy north of Colorado Springs, Colo., it was confronted with a problem in positioning the prestressed concrete girders for the highway bridges following their on-site casting.

A total of 112 girders, post-tensioned with the Prescon system, was employed in the highway bridges. Each girder weighed 96 tons, was 120 ft. long and had an overall depth of 5 ft., 11 in. Eight girders, spaced on 9-ft. centers, comprised each span of the 88-ft. divided highway.

Two 60-ton cranes could have done the moving job, yet they were not readily available in the area. The use of four 30-ton cranes was considered, but this course of action was ruled out because of the roughness of the terrain.

Thus, the following method was developed.

Two gantries, each with a 50-ton chain block were constructed. Mounted on rails which extended over the abutment on temporary steel trusses, these gantries, in effect, "straddled" each end of the girder in its casting bed. Subsequently, the gantry chain blocks hooked on to the lifting loops in each end of the girder and rolled it into its final position in the span.

Each girder contained 12 Prescon post-tensioning assemblies, and each of these consisted of sixteen ¼-in. diameter high tensile wires encased in flexible metal sheathing. After stressing to a total force of 1,370 kips in each girder, through the use of power driven portable 100-ton center hold rams, the metal sheathing was pumped full of cement grout.

After two spans of girders were erected, the diaphragms were formed and poured and the deck was concreted. The girders for the remaining spans were rolled on rails placed on the existing deck and again across the temporary trusses.

Concrete casting beds were constructed on one of the approaches to each bridge. These casting beds were aligned with the final location of the girders on the piers and abutments. Wooden side forms, fabricated in 20-ft. long panels were used to form the girders. These panels were bolted to inserts in the concrete form soffit at the base and tied across the top. Each panel was used an average of 15 times before major repair was needed. Both internal and external vibration were used for consolidation.

Each of the girders was fully prestressed and the tendons grouted before removal from the casting bed.

The Prescon Corp., manufacturers and suppliers of the prestressing tendons, provided stressing and grouting equipment and supervised the placing and prestressing operations.

Concrete mix and strength

The specified 28-day cylinder strength of the concrete was 5,500 psi, a cylinder strength of 4,500 psi, being required at transfer. This strength was achieved in an average of four to five days with no special curing. Concrete mix used for the girders was:

- 7½ sacks of type 1 cement
- 1,300 lb. of sand
- 1,760 lb. of coarse aggregate, maximum size, ¾ in.
- 30.5 gal. of water (4.07 gal. per sack of cement)
- 1.88 lb. pozzolith and 4.1% air

The 2-in. average slump resulting from this mix produced an average seven-day strength of 6,345 psi.

L. Boduroff of L. Boduroff and Associates, consulting engineers, Denver, Colorado, was consulting engineer to the general contractor. He also conducted loading tests on one 120-ft. girder.

Skidmore, Owings and Merrill, Chicago, Illinois, were the designers.

Helicopter sets poles for power line

THREE miles of new power lines have been installed in rugged mountain country in California, Santa Barbara County, by helicopters for the Pacific Gas and Electric Company. Both the setting of poles and the stringing of wire were done by helicopter in what is believed to be the first successful application of aircraft for this purpose.

Operating at elevations ranging up to 4,300 ft., a 12-passenger (Sikorsky) machine placed 59 wooden poles, one at a time, in holes previously dug on almost inaccessible land in Los Padres National Forest. A two-passenger (Bell) helicopter was used to transport personnel.

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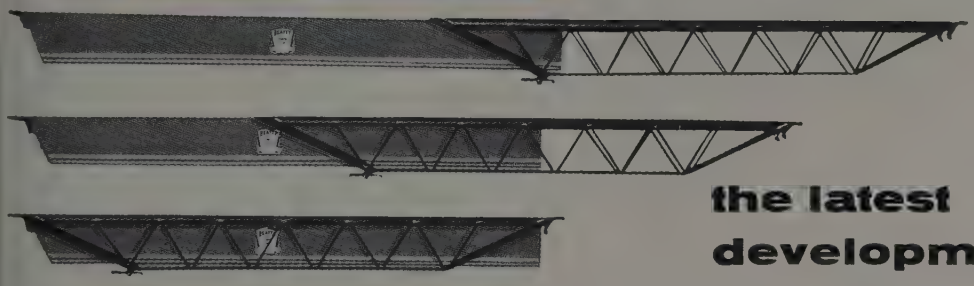

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U.S. Patent Ser. No. 574-765. Other patents in application U.S. & foreign countries.

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

After the holes were filled an tamped by the same ground crew that had dug them earlier, the two passenger helicopter made a serie of passes over the crossarms of th poles and laid out the three strand of wire necessary to carry the 12, 000-volt current. The wires will b attached manually to the insulator on the poles.

Rebars assembled and set as unit at Ice Harbor

A SIMPLER and safer method o setting reinforcing steel is bein used by the Holman Steel Erectio Co., subcontractors to Montag Halverson, Austin and Associates at the U. S. Army Corps of Engi neers' Ice Harbor Dam project o the Snake River. The method wa the idea of Chuck Morford, yard superintendent for Holman.

The entire curtain is assembled and tied flat on the ground and then hoisted into place as a com plete unit. This eliminates th climbing hazards as well as the dan ger of dropping or slipping stee rods.

Contractor officials estimate tha a dam job of the Ice Harbor Dam size would ordinarily require 130 men to do the steel reinforcing fab rication and keep up with the res of the construction schedule. A Ice Harbor under the new fabri cation method, 80 men are able t keep comfortably ahead of the con crete placement crew. The ground fabricating crew has been able t complete and place a steel rein forcing backbone to a spillway pie in less than nine hours. Under th old method, about three days woul have to be allowed for the work The 30-man crew of "rodbusters" has set as much as 90 tons of stee in a day.

Safety was demonstrated

Both contractors and Wall Walla District Engineers were wo ried about the safety factor an were dubious as to whether the fa ricated steel curtains with weigh often as high as 15 tons could b efficiently and safely placed. Th erection company's superintende did his convincing by performin The safety factor was partly assure in that it eliminated the climbi over the steel meshwork.

Ample and modern mobile cra equipment soon solved all placi doubts.

CONCRETE FRAMES AND FLOORS

Quality construction for Modern Office Buildings

These photos of the Simms Building in Albuquerque, New Mexico show the use of reinforced concrete frame and floor construction adapted to a modern office building. The first floor covers an entire city block and is surmounted by a 12-story structure and penthouse.

There are many reasons for the growing popularity of concrete frame and floor construction. It offers great strength, unusual durability, firesafety and economy. Its moderate first cost, low maintenance cost and long life add up to ***low annual cost,*** which pleases owners and investors. And competitive bids show that this method saves up to 40% on frame and floor cost.

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721 Boston Bldg., Denver 2, Colo. • Mezzanine, Placer Hotel, Helena, Mont.
425 Newhouse Bldg., Salt Lake City 11, Utah

A national organization to improve and extend the uses of portland cement and concrete through scientific research and engineering field work

Upper photo shows 12-story section of Simms Building above the roof of block-square first floor. The floors throughout are 6-in. thick reinforced concrete using a wide beam design and cantilevered 5 ft. outside the supporting columns. Architects and engineers: Flatow-Jason Moore. Contractor: Lembke, Clough & King, Inc. Both of Albuquerque.

. . . for more details, circle No. 53 on Reader Service Postcard

Liquid-filled tires

Information on hydroflating or weighting tires by adding water or a water-calcium solution in order to improve traction, from The Calcium Chloride Institute News.

By PAUL C. HORGAN
Equipment Specialist, Transportation Division
Department of the Navy
Bureau of Yards and Docks

FOR LOAD-CARRYING vehicles, such as tractors, motor graders and bulldozers, a simple method of adding weight to the drive wheels consists of partial liquid-filling instead of air-inflating the tires. This method of replacing 75% of contained air with a solution of calcium chloride and water is recommended for the tires.

Advantages

The advantages in using the calcium chloride solution are improved traction, increased draw bar pull, less slippage and tread wear, less bounce, and less fuel consumption, in addition to less demand for reinflation due to pressure loss. The solution will not seep through the tube, as will air. For maximum traction, all drive wheels should be water-weighted.

Tubes to be used in tires filled with calcium chloride solution are equipped with special sealed-in base valves which prevent separation of the rubber valve base and the valve metal.

Liquid-filling is also recommended for use with tubeless earthmover tires. Corrosion of tubeless rims is not a problem. However, for added protection, a coating of Rustoleum or equal may be applied to portions of the rim.

The table is based on actual measured volumes of tires mounted on recommended rims and of recommended pressures. (The added weight is based on use of solution which contains 4 lb. of calcium chloride per gal. of solution.)

Caution

When preparing calcium chloride solution, always pour the water into the container first; then add the correct amount of calcium chloride crystals stirring the mixture slowly. Never pour the water on the calcium chloride flakes. After the solution is mixed, allow it to cool before using.

Instructions

(1) Jack up one wheel and rotate so tire valve stem is at the top.

(2) Install conical cap or rim nut on valve to prevent valve stem from slipping inside rim. Remove valve core and bleed air pressure.

(3) Attach special hose connection (Schrader 8954 or Dill 6438A) to valve and to water or calcium chloride supply line.

(4) Insert water or calcium chloride solution. When using special hose connection, any back pressure built up inside the tire can be relieved by pressing on the release valve button.

(5) Check water level by pressing on release valve and rotating tire until water or solution runs out. Tire should be filled more than ¾ths full.

(6) When using a connection without a release valve, it is necessary to remove same in order to release back pressure inside the tire or check the water level. When doing this be sure to leave the conical valve cap or rim nut in place. Allow water to run out, or add more to get the desired level. Remove coupling and replace valve core leaving on conical valve cap.

(7) Inflate tire to about 10 lb. over the recommended pressure and then reduce pressure to 3 or 4 lb. above the recommended figure. Remove conical cap or rim nut. After a few days operation recheck the pressure in the tire and reduce to the recommended figure.

Tire Size	Percent Filling	Lbs. $CaCl_2$	Total Weight
8.25-20	75%	44	118
	100	60	161
9.00-20	75	60	161
	100	80	215

,000 feet up Mt. Shasta in northern California, Everitt Memorial Highway is being extended to Panther Meadows where a new ski resort is under construction. Timber is being cleared to make way for the six miles of new road; overburden is being moved; crushed aggregate is being brought in. But the toughest job of all is wrestling with tons of big rock. No wonder J. W. Briggs & Associates are using a fleet of Caterpillar track-type Tractors—seven D8s and three D7s.

"We especially like those Cat-built U-blades," says Supt. M. S. McMillan. "They really stand up on this rock." As with any piece of big yellow equipment, the reason for this better wear is better design and manufacture. The No. 8U Bulldozer shown on the D8 in the picture, for instance, has cutting edges made of special "Hi-Electro" hardened steel. Powering this 11′ 11″ blade is the 191 HP (flywheel) Cat D8 Tractor.

. . . for more details, circle No. 55 on Reader Service Postcard

Every detail of construction of this famous machine aims at easy handling of tough work: roller rims are forged of selected deep-hardened steel; track pins are made of selected medium carbon steel, "Hi-Electro" hardened; diagonal braces on the track roller frames are heavy steel forgings welded to nearly half the length of the frames.

Dozens of other features attest to the ruggedness of Cat-built crawler equipment and attachments. Get the whole quality story with a no-holds-barred demonstration on *your* toughest job. Call your Caterpillar Dealer today.

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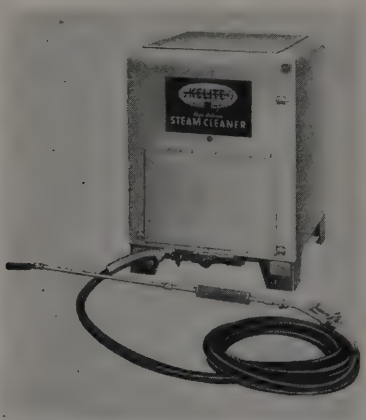
WHEN THE GOING IS REALLY TOUGH

Tire Size	Percent Filling	Lbs. $CaCl_2$	Total Weight
10.00-20	75	77	204
	100	101	269
11.00-20	75	80	215
	100	109	290
12.00-20	75	109	290
	100	145	387
12.00-24	75	121	322
	100	161	430
13.00-24	75	149	398
	100	201	538
14.00-20	75	165	441
	100	222	592
14.00-24	75	177	473
	100	238	635
16.00-20	75	197	527
	100	252	700
16.00-24	75	258	689
	100	342	914
18.00-21	75	252	750
18.00-25	75	334	892
	100	442	1182
21.00-25	75	496	1322
	100	662	1765
21.00-29	75	637	1700
	100	850	2270
24.00-25	75	612	1635
	100	820	2181
24.00-29	75	714	1905
	100	952	2540
27.00-33	75	1411	3765
	100	1885	5025
30.00-33	75	1531	4085
	100	2050	5470
30.00-41	75	1652	4410
	100	2210	5900
36.00-41	75	2520	6725
	100	3360	8970
33WB	75	1008	2690
	100	1343	3580

Steam cleaner without fire offers high-volume power

The Kelite Fireless Steam Cleaner is detailed in a 2-page bulletin offered by **Kelite Corp.** Bulletin describes how the cleaner, which is less expensive than comparable direct-fired steam cleaners, uses live



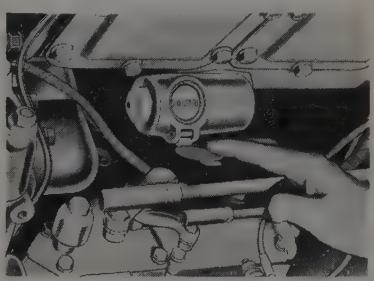
steam from an existing steam supply, thus providing the efficient cleaning power of high-volume steam cleaners. An illustrated description of how the Kelite works is included. The bulletin carries a table of specifications and a list of optional equipment.

. . . *Circle No. 236*

Index to engine maintenance

More than 20 years ago a counting device was introduced to help take the guesswork out of maintenance scheduling. Commonly known as the servicemeter, this valuable little instrument started a mild revolution.

WHEN the original servicemeters were first introduced, they could total 9999 service units before turning over to a zero reading. Not too many years later a fifth digit ring was added by the manufacturer when machine owners commented they had lost track of engine usage. This indicated that the instrument had fulfilled an important need, and some manufacturers have included a counting device as a standard part of each diesel engine.



The introduction of the servicemeter started maintenance operations on a scientific and practical path. For the first time it gave owners an accurate running record of engine operation. From this, an operational record of clutches, transmissions and other parts can also be kept.

Since its introduction, most of the factory recommended maintenance and servicing procedures on engines, machine parts and attachments have been tied directly to servicemeter readings. The familiar words, lubricate—adjust—inspect—drain—tighten — clean—inflate—refill—check—replace—are associated directly to the readings given by this instrument.

The servicemeters of Caterpillar Tractor Co., for example, count the number of revolutions made by the engine crankshaft, keeping pace with a clock only when the engine operates at a predetermined speed. If an engine is operated at higher than this speed for one hour, more than one clock will register on the servicemeter. The revolution counter type servicemeter offers an accurate way to measure the true use of an engine.

Your servicemeter can help you get the most out of your machine when the information it gives is coupled with periodic maintenance practices recommended by the manufacturer. Keep it in good order and rely on it. Maintenance can no longer be done by guesswork—it's neither practical nor economical.

Arc Welding Training Manual

THE AMERICAN WELDING Society announces that a committee has been formed to review the recently prepared Manual of Arc Welding.

This training manual will supply factual, authoritative information on arc welding, following the practices approved and recommended by the AWS.

Written expressly for manual welders, the material is basic in its approach and simplicity is its keynote. The Manual deals with each phase of arc welding in language which is simple, direct and easily understood.

A great amount of information has been condensed into a small space. Welding processes are explained and welding terms defined. A chapter on safety describes the measures to be observed for maximum safety. The arc welding process is described in detail and the accessories used are listed. A complete and comprehensive set of arc welding exercises is given in which the student is taken step by step from the striking of the arc to overhead welding. This is fully illustrated, showing both electrode manipulation and good and bad deposits. Arc welding equipment, identification of metals, metals and their structure comprise separate chapters. The last of the eight chapters is one of the most valuable. For the first time all the AWS electrode classifications have been listed in one publication. To obtain this information previously it would have been necessary to consult the many specifications dealing with electrodes.

Further information concerning this AWS Manual of Arc Welding may be obtained from the American Welding Society, 33 West 39th St., New York 18, N. Y.

(Readers are directed to last month's WESTERN CONSTRUCTION, which contained reviews of the free manuals available on welding of all types of interest to construction men.)

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. . . for more details, circle No. 56 on Reader Service Postcard

Best manuals on portable hoists

Here's a roundup of the best available literature on portable hoists, winches, tuggers, and pullers.

(Note: In the following reviews "trolley" will indicate a carriage which travels on an overhead beam.)

Coffing Hoist catalogs

A complete line of hand hoists (chain, ratchet-lever and spur gear) are described in a series of folders by the **Coffing Hoist Division** of **Duff-Norton Co.** Bulletin CL-6 presents features, capacities and prices of a full line of ratchet-lever hoists of ¾ to 15-ton size, with corresponding data on coil chain electric hoists up to 3-ton size.

Ratchet-lever hoists are described (Bulletins SP and L-3) in sizes from ¾ to 15 tons. These are the versatile hoists adopted to horizontal pulling.

Spur gear hoists in models from ¼ to 25 tons (Bulletins YC-YCT and CH) are described by means of a cut-away drawing and tables of characteristics with supplementary information on track and trolleys.

Electric hoists are described in Bulletin QL-2 with drawings of the motor drive, controls and tables of capacities and dimensions.

. . . Circle No. 159

The "CM" line of small hoists

The Chisholm-Moore Hoist Division of **Columbus McKinnon Chain Corp.** has three 12-page manuals prepared which fully describe and illustrate the company's popular line of small hoists. Particularly useful is the "CM" puller, which comes in capacities from ¾ to 6 tons. Made of aluminum alloy it pulls in any direction by manipulation of a lever 20½ in. long. On the 1½-ton model, 83 lb. on the lever produces 3,000 lb. at the hook. The ¾-ton model weighs only 14 lb.

Another manual describes the CM cyclone, a heavy-duty high-speed chain hoist available in capacities from ¼ to 10 tons. Also made of aluminum alloy. The 1-ton model weighs 36 lb. The brake is dry-operating and requires no attention. All bearings are prelubricated for life.

The third folder describes the Lodestar, an electrical chain hoist with push button controls which comes in capacities of 250 to 2,000 lb. and which weighs from 51 to 68 lb.

All of the above manuals do a very thorough job in describing all aspects of the machines. Full specifications are given for every model.

. . . Circle No. 160

Air hoist by Ingersoll-Rand

Ingersoll-Rand has an 8-page folder describing its light weight air hoists. The 39-lb. model lifts 1,000 lb. and the 56-lb. model lifts 2,000 lb. They lift their rated loads at 40 and 20 ft. per min., respectively. Specifications and data on accessories are included in the folder. The hoists can be furnished with top hook or trolley, pull chain control or one-hand pendant throttle control. An air motor cannot burn out even if overloaded or stalled.

Also available is a 44-page manual on the firm's full line of air and electric hoists the largest of which weigh over 3 tons. The lifting capacity of Ingersoll-Rand's air hoists range from 200 to 24,000 lb.

. . . Circle No. 161

Derricks, hoists and winches

Sasgen Derrick Co. has made available a manual and group of leaflets describing the company's line of derricks, hoists, winches, material elevators, and truck derricks. The firm's small hoists are of the type which wind a rope or cable on a drum by turning a crank-type handle. All models are clearly and factually described.

. . . Circle No. 162

Hoists of all types

An excellent 46-page, 3-color manual describing a large line of hoists of every type and capacity has been published by **Yale & Towne Manufacturing Co.** The smallest machine is the Pul-lift which weighs only 15 lb. in its smallest model and can lift from ¾ to 3 tons. Also described are many models of spur-geared chain hoists and hand hoists which range in capacity from ½ ton to 40 tons.

All models are completely described with tables of specifications and operating characteristics, photographs, and dimensional drawings accompanied by descriptive text. The last few pages are devoted to brief descriptions of the company's line of electric hoists, which can be either hook or trolley-mounted.

The manual includes a valuable discussion of general hoisting principles, work, mechanical efficiency, and comparisons of types of chain hoists. A very fine manual.

. . . Circle No. 163

Bulletin on drum hoists

Bulletin 853, available from **Stephens-Adamson Mfg. Co.** describes several models of drum-type winches which are mounted either on the floor or on the wall and are powered by motors or by hand cranks. The hand-operated machines come in models varying from 56 to 155 lb.

. . . Circle No. 164

Bulletins on hand and electric chain hoists

Two folders give complete specifications and characteristics of the electric and hand chain hoists manufactured by **Robbins & Myers, Inc.** These electric hoist models vary in weight from 85 to 100 lb. and in lifting capacity from 500 to 2,000 lb. One-half horsepower motors are used in the three models.

Fully described with specification tables is the "Bantam" spur-geared hand-chain hoist. Models vary in capacity from ½ to 6 tons and in weight from 44 to 189½ lb. Other models of chain hoists are available in capacities of from ¼ to 25 tons, weighing from 67 to 1,320 lb. The folders include dimensional drawings and list prices.

. . . Circle No. 165

Folders on hand and electric hoists

The Chester Hoist Division of **The National Screw & Manufacturing Co.** has available four

olders describing its line of small oists. The electric hoists include 1-ton capacity double chain odel with rope controls, ¼ and ½-ton models, single chain, with ope controls, and a series using vire rope with push button conrols in capacities of ¼, ½, 1 and 2 ton. One folder describes and handy Zephyr spur-geared hand hain hoist, which is available in our sizes from ½ to 2-tons capacty. The largest Zephyr weighs nly 83 lb. All models are fully escribed and illustrated with phographs and cut-away views. The olders include specification charts howing all operating characteristics and prices.

. . . Circle No. 166

Philadelphia line detailed

A 12-page catalog on Philadelphia hoisting equipment, available n ½-to 25-ton capacities, may be had on request. Data includes prices, dimensions and capacities for the company's line of spur gear, screw, differential, and trolley hoists. Also available is a separate specifications sheet on the new Army Type hoist. **Philadelphia Hoist Division of Industrial Enterprises, Inc.**

. . . Circle No. 167

Tugit, Budgit information

Tugit, a "tool-box size hoist," with up to 2-ton capacity, is detailed in two publications put out by **Manning, Maxwell, and Moore, Inc.** A 4-page, 2-color illustrated bulletin provides operating features, specifications, and prices. Also available is a parts list and instruction sheet on Tugit.

Several bulletins may be had on the company's Budgit line of roller and aluminum chain blocks. Included are maintenance instructions, mechanical advantages and dimensions for the ½ to 2-ton capacity roller chain block and for the Budgit Hi-Cap chain blocks.

. . . Circle No. 168

4-page Thor manual

Illustrations and descriptions of the new lightweight Thor H-1000 air hoist are presented in a 4-page manual produced by **Thor Power Tool Co.** The bulletin on this 1,000-lb. capacity model also includes tables on rate of ascent and descent under various load conditions and air pressures.

. . . Circle No. 169

Catalog from Chicago Pneumatic

Three full pages of descriptive material on **Chicago Pneumatic Tool Co.**'s complete line of hoists, which are unique because of a cathead which can be rotated while the drum is stopped, are included in a current catalog. Illustrations, features, methods of operation and control are given for the company's line of winches and chain hoists. Also included are installation specifications and dimensions.

. . . Circle No. 170

Chain hoists to 30 tons

In 20 pages filled with specifications and instructions on hoists and hoisting problems, **Reading Chain & Hoist Corp.** describe their hoists from a single chain starting at ½-ton capacity to a twin unit with a maximum capacity of 30 tons. Dimensions, operating characteristics and prices are included. Trolley types in plain and in geared design are also described and illustrated.

. . . Circle No. 171

Move the hoist to the job

Under the name of Krane Kar the **Silent Hoist & Crane Co.** have bulletins describing this hoist mounted on its own transportation unit which is completely portable and in models handling loads up to 20,000 lb. at 4½ ft. The boom telescopes from limits of 13 to 20 ft. and the mobile unit can move at speeds up to 12 mi. per hour. The swing of the boom is 180 deg. Two 4-page folders describe and illustrate the different models.

. . . Circle No. 172

Hoists in wide variety

Three leaflets describe the wide range of small hand and powered hoists of the **King Manufacturing Corp.** Smallest and simplest unit is a hand operated derrick with a 1,000-lb. capacity weighing only 225 lb. It is demountable (boom and mast separate) and has a full circle swing. This hoist can also be modified to operate on gasoline or electric power. Another hoist is designed to operate in lifting loads on a platform up an inclined track, designed primarily for building construction. Finally, a line of semi-portable wire rope hoists have capacities from 400 to 1,000 lb. These are operated by small gasoline engines and develop hoisting speeds at 200 ft. per min. This line of hoisting equipment is described in three folders presenting dimensions and operating features.

. . . Circle No. 173

Griphoist—A versatile tool

A 4-page illustrated folder complete with cutaway drawing and specifications describes this portable hoisting and pulling machine. The hoist operates on a wire rope which passes through the machine and is gripped alternately with steel jaws. The manually operated handle furnishes power. With a weight of only 42 lb. the Griphoist handles loads up to 3,300 lb. with complete security. The wire rope, of any length, passes through the hoist in a straight line and is not reeled on a drum. Normal speed of the rope through the hoist is about 10 ft. per min. **Griphoist, Inc.**

. . . Circle No. 174

Winch operates on compressed air

Atlas Copco has a winch-type air hoist designed to operate on compressed air, for dragging, skidding or lifting on construction jobs. Control is positive from creep to full speed and the unit conforms to all safety codes. The leaflet describes the hoist and lists its dimensions and features.

. . . Circle No. 175

Beebe Bros. hand winches

From small size units designed to handle 250 lb. to a heavy-duty model which will handle a maximum of 15 tons, these well known units of **Beebe Bros.** are all hand operated and have long been described as "the strongest geared power for its weight in the world." The 4-page folder describes all of the models with dimensions, characteristics and capacities with different sizes of wire rope. Five models are described together with accessories.

. . . Circle No. 176

Joy hoists on air

With reversible Pistonair motors with power up to 12 hp. the Joy hoists have a range up to a 3,500-lb. capacity. Five sizes are provided in this range with differing capacities of rope and speed to meet various hoisting needs. The smallest model (AW-80) is a lightweight winch weighing only 90 lb. and

with a rope pull of 750 lb. is a versatile unit for hoisting wherever air is available. On all models the air motors are either 4 or 5 cylinders providing smooth operation. A 12-page catalog pictures, describes and presents characteristics of these models and larger units. **Joy Manufacturing Co.**

. . . Circle No. 177

Hand hoists that are Wright

Several types of hand hoists and a differential chain hoist are described in leaflets available from **Wright Hoist Division of American Chain & Cable.** Under the name Pull-A-Way the hoists are hand operated using chain for pulling and represent a portable tool for all types of pulling and hauling requirements. Dimensions and operating characteristics are indicated.

. . . Circle No. 178

A winch to load trucks and trailers

Designed specially for the hand loading of machinery or materials onto trucks and trailers, the **M-B Corp.** has its M-B winch with capacities of either 2 or 4 tons. Normally the winch is attached to the bed of the truck directly behind the cab and a single line with hook is rated at 2 tons. With a snatch block the unit handles 4-ton loads. The unit is pictured in a leaflet.

. . . Circle No. 179

NEW LITERATURE

The right pump for the job

A handy reference chart which tells you at a glance which pump will best take care of that dewatering job, which model is preferable for sprinkling, fire protection, tunneling, etc. is featured in a 4-page leaflet put out by **Barnes Manufacturing Co.** Opposite this useful chart are pictures of the pumps referred to, with a full description of each. Barnes pumps come in capacities to 90,000 gal. per hr., heads to 380 ft., and drives which include gasoline, electric, and pulley.

. . . Circle No. 180

M-R-S line detailed

The M-R-S Manufacturing Co. announces the availability of a new catalog entitled The Complete Line of Contractor Proven High Capacity Equipment. This catalog covers the complete line of the company's heavy diesel wheel tractors and allied equipment. In addition to presenting brief specifications on tractors and scrapers, the catalog provides a detailed description of the advantages of the M-R-S hydraulic weight transfer. Detailed color plate illustrations.

. . . Circle No. 181

Thew shovel crane in action

A 2-color, 16-page catalog published by **The Thew Shovel Co.** shows detailed features of their self-propelled, shovel crane, Model SP-107. Dramatic action views demonstrate the full mobility in crowded quarters and the tractive effort for off-the-highway travel of the versatile ⅜-yd., 7-ton model. The short-coupled, square design of the rubber-tire carrier with 4-wheel drive and available 4-wheel steer develops the full rated lifting capacity at all positions of the full 360-deg. swing—without outriggers. 3 or 6 travel speeds to 15 mph. are available. Automatic transmission and torque converter are standard. The interchangeable shovel, clamshell, dragline, hoe and crane front ends are described and shown in action in the new catalog.

. . . Circle No. 182

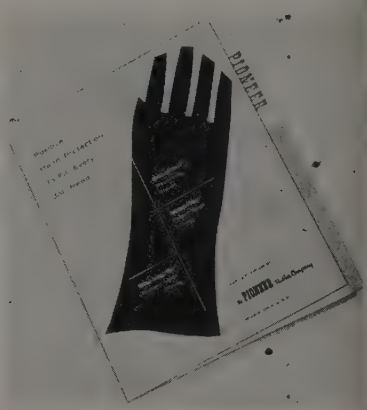
Helpful films and booklets offered by Airco

Recently published by **Air Reduction Pacific Co.** is a Publications and Audio Visual List. The booklet briefly describes many of the Airco publications and audio visual items which may be had on request and, except for the hard-cover instruction texts, without charge. The publications listed cover various applications of industrial gases, and welding and cutting techniques and equipment. The motion pictures depict the latest developments in automatic welding, machine gas cutting, and other processes and products. A selection of sound slide films is offered to help teach students, welders, technicians, and foremen the operation, proper maintenance and safe use of modern welding and cutting equipment.

. . . Circle No. 183

The right glove for the right job

An attractive, 3-color catalog from **The Pioneer Rubber Co.** gives complete specifications and factual information on the entire Pioneer line of liquid-proof gloves. Especially designed for book shelf use or easy filing, the catalog gives at-a-glance information on the actual performance of the company's gloves when used with over 100 oils, acids, caustics, and solvents. With the aid of a glove selector check list, also included in the publication, buyers are given the essential factors in choosing the right glove for the right job. Pioneer gloves are made in four general types with various weights and sizes and styles in each group. Full descriptions given of each.



. . . Circle No. 184

Two Armco bulletins

Armco Drainage & Metal Products, Inc., offers a 34-page application bulletin to contractors titled Armco Steel Buildings for Construction Projects. The bulletin gives a brief history of steel buildings, discusses how contractors and owners can reduce the overhead cost of job-site buildings, pictures many installations from complete towns to tool sheds, and illustrates simplicity of erection. Bulletin also contains data for planning job-site buildings and information about accessories. Also available is a newly revised booklet describing Armco's steel buildings featuring

the Steelox panel construction. Types include shed roof, gable roof frameless, and gable roof rigid frame. More than 5,000 sizes are available. Accessories are detailed and various types illustrated.
. . . Circle No. 185

Two Brockway booklets

Eighty years ago you could have written to Brockway and received information on a fine line of carriages and wagons. That's how long Brockway has been in the transportation field. Today the firm offers a full line of heavy trucks, including recently introduced off-highway models. Two booklets just published and available for the asking illustrate the various models, which feature gas, LPG, and diesel power. The production of every model is geared to permit custom building to suit individual needs. Easy maintenance is assured by ready availability and interchangeability of parts and by the exclusive Swing-away fender which bares the engine compartment. Specification sheets are also available. **Brockway Motor Trucks** is a division of Mack Trucks, Inc. *. . . Circle No. 186*

Handy electrode guide

One of the most useful looking booklets we've seen in quite a while is a 70-page Electrode Pocket Guide put out by **Air Reduction Pacific Co.** Of interest to anyone concerned with buying or using electrodes, the booklet is an electrode consumption calculator in tabular form, which provides data for calculating consumption per linear foot in the welding of various types of joints. The Guide describes each Airco electrode, its color code, its application, and the best procedure for its use in welding. Weld-metal chemical analysis and mechanical properties are fully explored.
. . . Circle No. 187

Slash costs with Duo-Pactor

How to slash equipment costs by using only one machine to do all types of fill and base compaction, seal coating, and surface rolling is explained and illustrated in a 24-page **Seaman-Gunnison Corp.** catalog. "Compact Facts about the New and Revolutionary System of Duo-Paction" tells its story simply and effectively with illustrations and diagrams. It explains how the combination of pneumatic and steel rolls in a self-propelled unit enables the Duo-Pactor to do the work of two or more separate types of equipment, and how the alternate action of rubber and steel rolls produces higher densities.
. . . Circle No. 188

Steel shoring comes into its own

Steel shoring is rapidly replacing heavy lumber as falsework for overpasses, bridges, and slab work. A new booklet, recently published by **Tubular Structures Corp. of America** on the subject of heavy-duty steel shoring, gives a complete description of the advantages of new steel shoring. In addition, this brochure makes a direct comparison between the costs of steel and lumber. Also included are actual plans for several bridge jobs on which steel shoring was used.
. . . Circle No. 189

Something for highway engineers

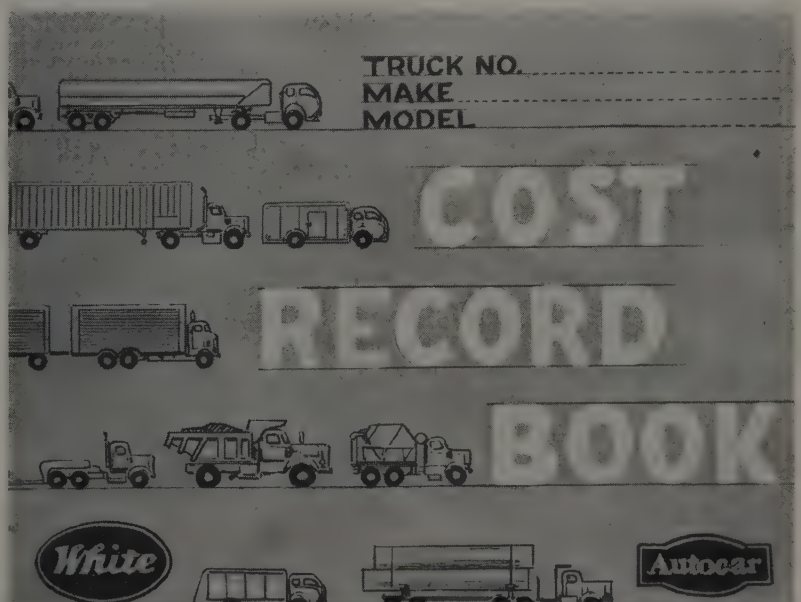
"How to Specify and Use Pressure Treated Wood for Highways," is the title of an 8-page, illustrated booklet issued by the Highway Committee of the **American Wood Preservers Institute.** The publication presents basic specification requirements for each illustrated major highway use of pressure treated wood. Tables show minimum retentions required for all types of presevatives when used in major species of highway lumber and timber. Booklet contains helpful information for experienced highway technical men and much that will enlarge the working knowledge of those with less experience. *. . . Circle No. 190*

Le Roi rotary air compressor

An eight-page, two-color bulletin, P-106B, describing the Le Roi 600 rotary air compressor has been issued by the manufacturer, the **Le Roi Division,** Westinghouse Air Brake Co. Several excellent photographs are included and close-up views of individual features are listed. Covered also are design and the unit construction of the compressor. *. . . Circle No. 191*

Catalog describes H-W line

Huber-Warco Co. is offering a 32-page brochure covering their complete line of road machinery products. This book outlines the bonus features of Huber-Warco motor graders, tandem and 3-wheel rollers and the maintainer. Detailed photographs illustrate the inner-working parts of the equipment. *. . . Circle No. 192*

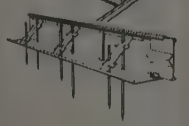
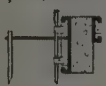


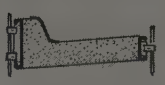
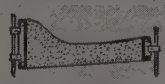
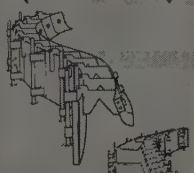
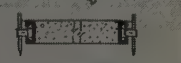
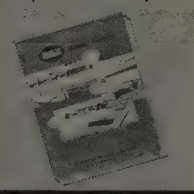
THE 36TH ANNUAL edition of *The White Motor Co.'s* Cost Record Book for truck fleets is now available. The book has a new cover and is revised for modern fleet cost practices. Available free to fleets and all truck operators. *. . . Circle No. 193*

SAVE TIME AND MONEY

at REX® "SINGLE-STOP" FORM MARTS!

You'll be time and money ahead by getting all your forms from your Rex Distributor—the complete, fast "shopping center" of unbeatable low prices. Here's every type and size—all with the same important advantages for simpler, speedier setups with stronger, easier locking end designs; greater re-use life; *far lower costs over more jobs!*

FORM	TYPE	WHERE IT SAVES
	single wedge road form	for lowest forming cost of all "average" jobs—streets, roads, etc. (Interchangeable with double wedge design.)
	double wedge road form	the high-strength, self-aligning, heavy-duty forms for expressways, highways, all heavy slab work.
	airport form	two-way design; one set of forms gives you two different slab thicknesses. All sizes.
	curb form	for vertical front and back.
	curb form	for partially battered front section.
	curb form	for curbs of fully battered front section.
	curb form	for placing curb to in-place slab.
	curb form	for curb integral with slab.
	curb form	standard 12" curb form is "stacked" with 4" section for special jobs.

FORM	TYPE	WHERE IT SAVES
	combination curb and gutter	for work requiring 5' joints. Straight, single or double radius face form. (Division plates can be placed any distance in 1' increments.)
	combination curb and gutter	for 10' joints. Straight, single or double radius face form. (Division plates can be placed any distance in 1' increments.)
	combination curb and gutter	where joints are not required.
	combination curb and gutter	roll type forms—hand-formed face.
	flexible steel form	for placing radius curbs to in-place slabs.
	flexible steel form	for curbs and gutters of any radius. Straight or battered front section. Also rigid radius forms.
	flexible steel form	for curb work of any radius.
	sidewalk form	for fast forming of sidewalks—all widths, thicknesses. Division plates of any spacing.
		

FREE—Handy Form User's Guide

This fact-filled, easy-reference guide gives helpful information on all Rex Forms—for faster forming of your jobs. Ask your Rex Distributor for complete catalog.

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CHAIN BELT COMPANY

® PUMPS • PAVERS • SPREADERS • FINISHERS • FLOATS • CURING MACHINES • FORMS

. . . for more details, circle No. 59 on Reader Service Postcard

The advantages of bucket drilling

Methods Manual, a 16-page booklet that illustrates and describes the advantages of bucket drilling as a method of excavating, has just been published by **Calweld, Inc.** Written especially for general contractors, excavators and drillers, the Methods Manual includes many on-the-job photos which show how earth drilling provides a fast, economical method of excavating for tank burial, foundations, manholes, cesspools, soil tests, mining and many other digging jobs. Two outstanding advantages of earth drilling, as described in the Manual, are the complete elimination of all hand digging and the speed with which earth drilling is accomplished. In drilling foundation holes, for example, performance reports show that 12 caissons (24-in. diameter x 20-ft. deep) with 2½ to 6-ft. diameter bells were drilled, belled and casings placed in one day. *... Circle No. 194*

Euclid twin-power scraper catalog

"Designed for a new era in earthmoving," is the title of a new 24-page catalog featuring the Model TS-24 Euclid "Twin" Scraper. Graphically illustrated, with cut-away views and diagrams of major components as well as "at work" pictures from a variety of jobs, the booklet covers all features of design, operation and performance of this 24-yd. (struck) scraper. Of special interest is a section devoted to Twin-Power—what it is, how it was developed, and what it means in terms of increased productive capacity. **Euclid Division, General Motors Corp.** *... Circle No. 195*

Caterpillar shop bulletin

Anyone using or servicing Caterpillar tractors will welcome **Owatonna Tool Co.'s** new service bulletin. This 16-page booklet features a wide range of hydraulic and manual tools designed specifically for Caterpillar equipment, along with detailed instructions on how to do hard jobs faster. Included are special OTC hydraulic and manual pulling and installing tools for gears, bushings, drive sprockets, main bearings, grader wheel hubs and the like; track pin presses to remove and install track pins and bushings without distorting or damaging sidelinks; cylinder sleeve puller-installers (for wet and dry liners), and shop presses. *... Circle No. 196*

Data on shoring-forming system

A 44-page magazine called "Acrow Review" available from **Acrow of California** describes by fully illustrated job articles from all over the world the use of the company's line of shores, scaffolds and forms. Of special interest is an article on the V-form system which features the use of the same steel-backed prefabricated plywood panels for forming both the slab and the walls. (The system is described in a field story beginning on page 27 of this issue of WESTERN CONSTRUCTION.) Also available without charge, as long as a limited supply lasts, is a 210-page thumb-indexed catalog of Acrow's extensive line of construction products. *... Circle No. 197*

Uniform blacktop coverage

An illustrated bulletin, published by **Rosco Manufacturing Co.**, shows how a bituminous maintenance distributor featuring uniform coverage mounts and operates on a standard truck. Complete specifications are included. Two models of the distributor, the 1,000-gal. RHU and the 800-gal. RHU, are shown as they will appear when actually mounted. Optional spraybar equipment is also discussed showing lengths available to 12 ft.

A breakdown of advantages in efficiency and performance singles out ease of maintenance and repair, an enclosed positive displacement pump, 1½-in. fibre glass or rockwool insulation, convenience of operator's controls and ten other features. *... Circle No. 198*

Literature briefs

SUBMERSIBLE PUMP—Specifications sheet and an 8-page booklet on the Flygt Drainer has been issued by **Stanco Mfgs. & Sales Inc.** *... Circle No. 199*

TAILGATE LOCK — Installation instructions on the "Dun-Lockin" automatic tailgate lock have been put out by the **U. N. Co.** *... Circle No. 200*

SHOVEL—Specifications are available on the Bantam shovel, product of **Schield Bantam Co.** *... Circle No. 201*

EXCAVATOR—A 4-page bulletin on the crawler-mounted 805 Excavator has been published by **Koehring Co.** *... Circle No. 202*

LINK-BELT—Devoted to applications of shovels, draglines and cranes is the Link-Belt Speeder News. Available on request. **Link-Belt Speeder Corp.** *... Circle No. 203*

ROCK DRILLS—**Atlas Copco's** automatic pusher leg for rock drills is described in a 2-color illustrated leaflet. *... Circle No. 204*

FORMING — On-the-job accounts of the Gates rod system presented in a 6-page foldout. **Gates & Sons, Inc.** *... Circle No. 205*

TRUCK PARTS — **White Motor Co.** has available a "Parts Want Book" in which to list your truck needs. *... Circle No. 206*

WHEELERS—A 4-color specifications sheet on the **Minneapolis-Moline** wheelers for loaders, mounted equipment or drawbar jobs is yours on request. *... Circle No. 207*

SAFETY — The requirements for setting up and enforcing a job-site safety program on construction projects have been issued by **National Constructors Assoc.** *... Circle No. 208*

ASPHALT PLANT—Complete details on the **White Mfg. Co.** L-20 portable asphalt plant are available in an attractive circular. *... Circle No. 209*

B. & G. Crane Service

Makes The "Big Lift"

C.I.T. is On the Job, too

It took finger-tip crane control to put the 13 arches in place for the new $6,000,000 Moisant International Airport on the outskirts of New Orleans, Louisiana. Each 9-ton arch had to be held in place while skilled steel workers connected it to the structural steel of the Terminal Building.

B. & G. Crane Service, Inc. handled all the steel erection. This was the biggest job yet for the expanding firm owned by Mr. X. J. Grilletta and Mr. L. Bronzo. Three P. & H. cranes were kept busy continuously on the project. All of them were bought as part of a well-planned expansion schedule based on a financing program set up by C.I.T. Corporation. This same financing program had previously put a number of cranes and other profit-making equipment to work for B. & G.

How Job-Engineered Finance Plans Can Help You

Payd Plan equipment financing terms to 6 ye with payment schedules related to depreciati or equal monthly payments over 36 months, skip-payment plans where needed . . . these a just a few of the helpful financing tools offered you by C.I.T.

In addition to equipment purchase financi C.I.T. can help you improve your bid and bo capacity, meet current operating expense or oth business needs by arranging capital loans. C.I representatives know how to lay out "job-en neered" finance plans, carefully devised to your needs. Why not call or write? No obligati of course.

Here are two of the three P. & H. cranes used on the job. All told, one 35-ton truck crane, one 20-ton crawler crane and one 12½-ton truck crane were used along with 6 welding machines.

Vice President Louis Bronzo, C.I.T. representat Ray H. Durham and President X. J. Grilletta together on the details of the continuing equipm finance program.

C.I.T. CORPORATION • MACHINERY A

wo B. & G. steel workers prepare to
nnect the arches as the big cranes
ld the heavy steel in place. Here's
here top notch equipment and expe-
enced manpower pay off.

NEW EQUIPMENT

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

Mark II is streamlined

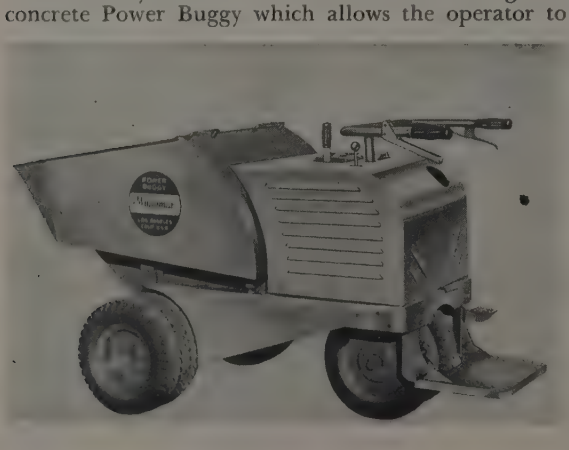
Capable of digging to a depth of 12 ft. 6 in. with a loading height of 8 ft. 6 in., the new Henry Mark II backhoe digs with 20% more power than former models at any angle within a 200-deg. arc of swing. It also offers a continuous swing of 200 deg. and faster,

smoother control. Operating at a pressure of 1,500 psi., the Mark II has crowd, bucket, and swing cylinders of 3½-in. bore with 2-in. chromed rods, and a boom cylinder of 4-in. bore with a 2-in. chromed rod. Individual controls also operate the hydraulic outriggers. One readily apparent new feature of the backhoe is the streamlined effect of its boom which has been designed and constructed to enclose the boom cylinder and hydraulic hoses. Another outstanding feature is its fast detach characteristic, making it possible to leave the tractor's rear free in a matter of minutes for other work. It is also mounted closer to the tractor for increased stability and smoother transport. **Henry Manufacturing Co.** ... *Circle No. 210*

Walk-or-ride power buggy

An entirely new model of the **Whiteman Mfg. Co.** concrete Power Buggy which allows the operator to either walk behind or ride on a fold-down platform is now available. Known as the Walk-or-Ride Power Buggy, it is compact, lightweight and extremely maneuverable. It is designed to travel over narrow, light runways, onto elevators and through doorways as narrow as 31 in. Capacity of the new unit is 10 cu. ft. of concrete. It features a positive-control dumping mechanism that permits placing the concrete neatly and accurately. Powered by a Wisconsin engine, it has front-wheel chain drive, automatic clutch and forward and reverse drive. Speed is up to 5 mph. Having a low center of gravity, it corners fast and will turn on a dime. Also available with a flat bed body.

... *Circle No. 21*



Dart adds 15-ton dump truck to line

Currently manufacturing off-highway trucks in the 10, 25, 35 and 50-ton capacities, the **Dart Truck Co.** has now made available a 15-ton end dump truck

which is adaptable to a wide range of work and haulage requirements. The truck is particularly versatile and is recommended for use in quarries, mines and heavy construction work. In order to meet the varying conditions, a number of optionals are offered. The diesel power plant, for instance, is 175 hp. or 220 hp. Single and three-stage torque converters are offered. An 11-cu. yd. rock body is standard equipment with the trucks. Tires are 13.00 x 25, 18-ply on the front and 14.00 x 25, 20-ply duals on the rear.

... *Circle No. 21*

Off-highway mobility

Built especially for off-highway field service, the FABCO FAB 100 4 x 4 is the result of an engineering study made by the **F.A.B. Mfg. Co.** and Engineer Limited Pipeline Co., the owners of the truck pictured. Designed to give greater traction, stability, maneuverability, and low maintenance, the FAB 100 features equal power and equal load for all wheels, 80-in. track and 61⅝-in. spring centers; 111-in. wheelbase for a 14-ft. body as compared to a 160-in. wheelbase for ordinary 4 x 4's with the same 14-ft. length body; 50% tighter turning radius due to the short wheelbase and a unique front drive axle joint with 35-deg. turning angle. Other features are: forward tilt hood for engine accessability; unique front spring

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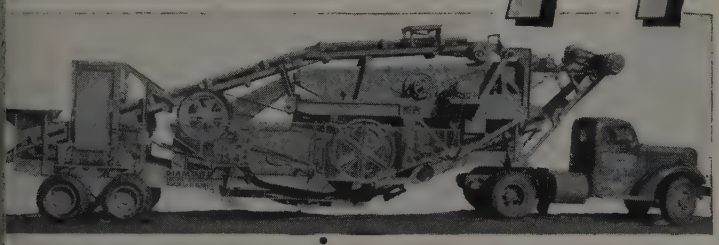

PORTABLE *Rotor-Lift* CRUSHING PLANT

When you can turn out 240 tons per hour of 1-inch minus road aggregate in 70% crush, you're bound to make money. That's the record of an all-electric Diamond 77 on location in a Utah gravel pit. Screen, rotor lift and each conveyor is driven by its own electric motor for positive, trouble-free operation . . . continuous production.

The Diamond 77 outproduces every machine in its class. Ask any Diamond user. He'll tell you he gets high production at low cost consistently. Wherever the Diamond 77 works, hourly output of 300 to 400 tons of ¾" road gravel in 25 to 35% crush is repeatedly reported. Substantial tonnages are obtained even in hardest rock.

Record productions were Diamond engineered from the very beginning. Material flow is shorter . . . faster. Diamond's "Line Flo" Rotor-Lift insures speedy, continuous movement of aggregate . . . eliminates by-passes . . . bottlenecks. Oversize crushers, vibrating screen and extra wide belt conveyors give that extra capacity for greater output . . . smooth, dependable operation.

Add Diamond's complete portability . . . ready for the road without costly delay . . . readied for operation at new locations just as easily. And remember, Diamond 77 outproduces every machine in its class . . . in fact regularly exceeds its own rating. So before you decide on a crushing plant . . . see Diamond.

For full description, write for Catalog D-5415.

DIAMOND IRON WORKS

DIVISION

GOODMAN MANUFACTURING COMPANY

Halsted Street and 48th Place • Chicago 9, Illinois

. . . for more details, circle No. 61 on Reader Service Postcard

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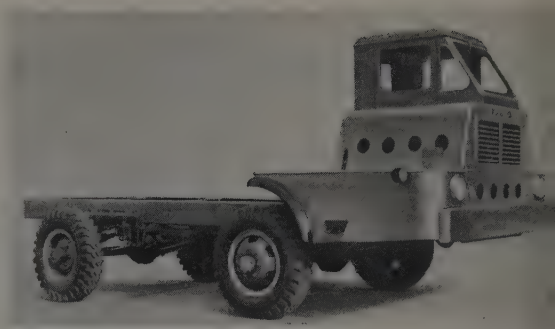
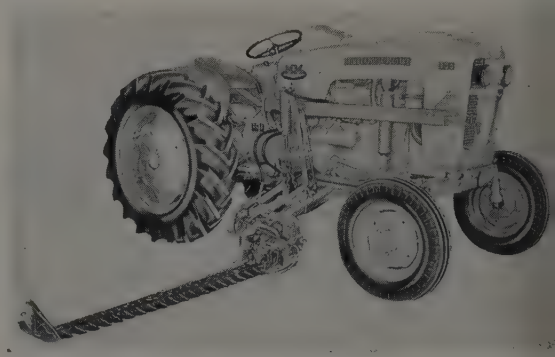


suspension in connection with the front driving axl which transmits full engine torque and has greate load capacity. *. . . Circle No. 2I*

Mower attachment for MM tractor

A side-mounted industrial mower with MM close coupled drive, hydraulic controls, high cutting speed simplicity of mounting, and 135-deg. cutting angle i

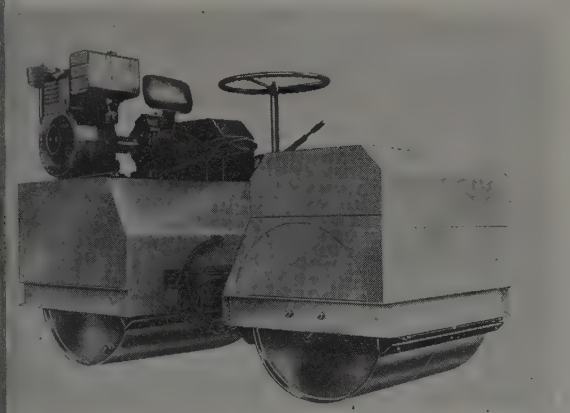


announced by **Minneapolis-Moline Co.** as the Mode SO Industrial Mower. It fits the MM 335 and 44 tractors. The MM center power-takeoff located unde the transmission housing drives the new SO mowe by a heavy-duty V-belt running directly from the pt pulley to the sheave on the mower—a distance of onl 28½ in. On conventional side-mounted mowers, th drive has to be transmitted from the rear pto to V-belt, a universal joint, and a long drive shaft bolte to the rear axle and the tractor frame. This cumbe some arrangement is eliminated on the new mowe In addition, the rear pto is left available for othe attachments. *. . . Circle No. 2I*

SHOWN IS THE NEW WORK BULL 1001 Loader, a produ of *Massey-Ferguson Industrial Division.* Here the multi-purpo loader, with its ⅞-cu. yd. payload capacity, is shown hoisting load of sand into a truck. No-shift, instant reversing make ideal for stockpile work. The loader has a low pivot point f direct line thrust, but has telescoping arms for extra-long reac *. . . Circle No. 2*

½-ton roller added to Midland line

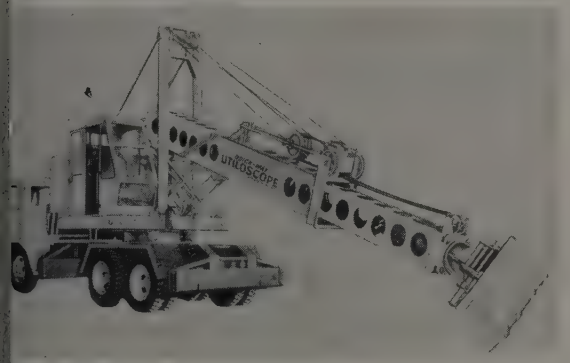
Midland Products Co. announces they now have in oduction a 1½-ton power roller. Center-pivot steer-g, an exclusive feature with the Midland 150, enables th rollers to turn, assuring perfect tracking of the



r roller. The combination of Center-Pivot Steering d both rollers being the same width, affords full com-ction from both rollers and eliminates lap marks. ith only a 3-in. body overhang, the 150 is extremely neuverable in confined areas. A 9-in. ground clear-ce provides flush rolling up to curbing. The roller owered by a Briggs and Stratton 9-hp. engine. Both nt and rear rollers are equipped with spray bars d cocoa mats. Empty, the unit weighs 1,480 lb.; with ter ballast, 2,860 lb. *. . . Circle No. 216*

ore scope with Utilo-Scope

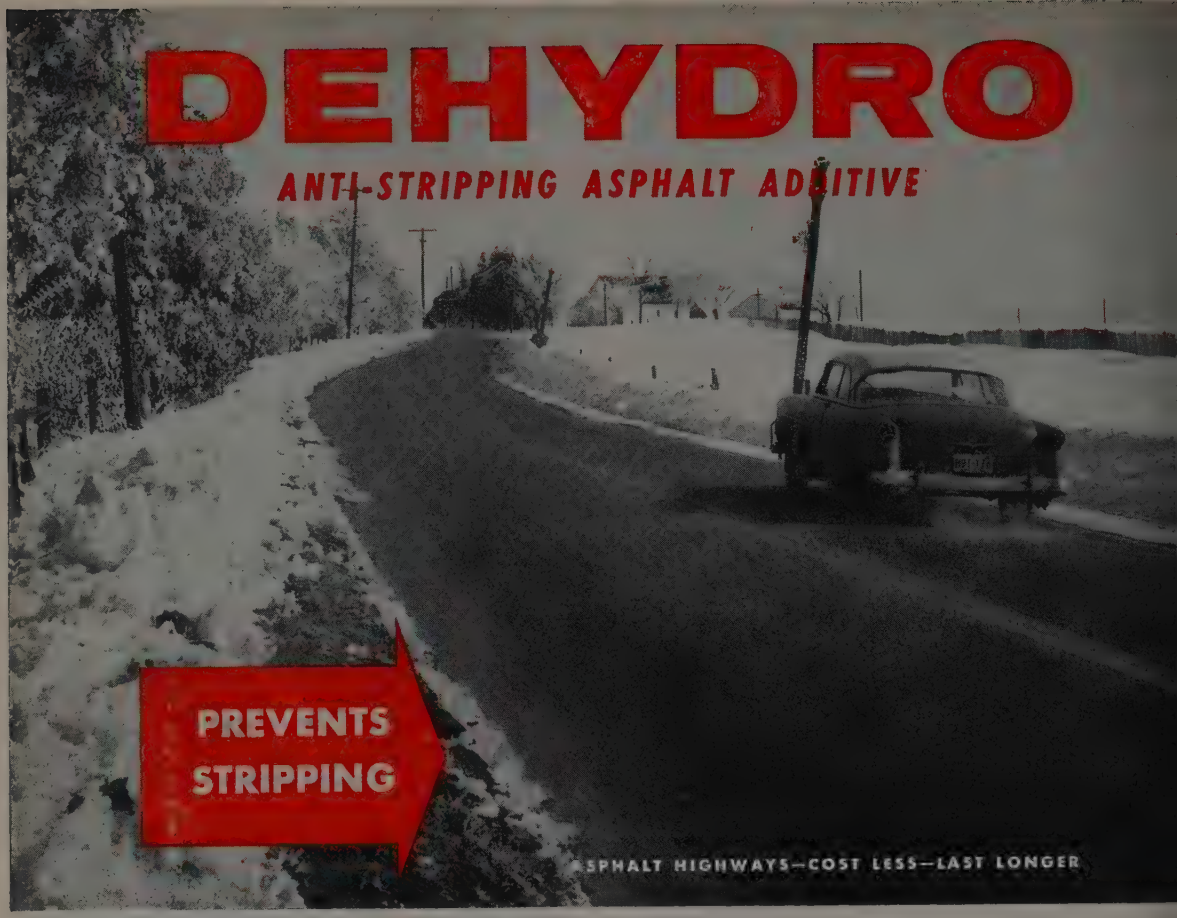
The Utilo-Scope, a hydraulically operated telescop-g grading and digging attachment, has been an-unced by the **Quick-Way Truck Shovel Co.** This

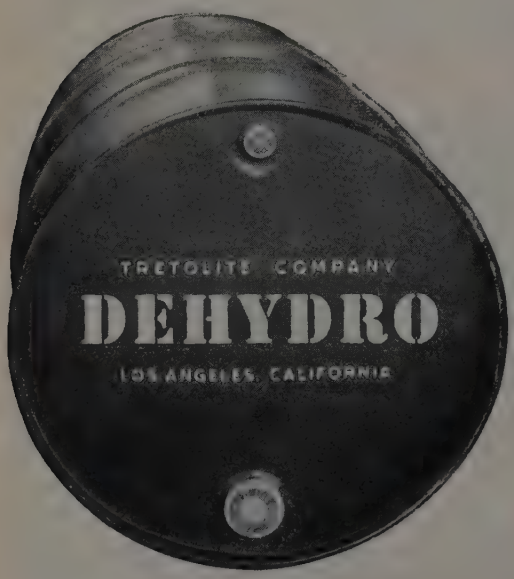


achment replaces the Chore-Master introduced by company last year and incorporates a number of w improved features. The attachment makes pos-le a completely new, wider range of jobs with the ick-Way Model 125A Truck Crane. The hydrauli-ly operated boom will precision grade slopes and dsides, rip pavement, dig under and around obsta-s, clean ditches, and load trucks. The attachment om extends to a radius of 31 ft. The bucket or ding blade swivels from side to side and opens and ses with a wrist action. The attachment can be noved or installed on the Quick-Way crane in one ur and it is possible to switch to a standard crane om, trench hoe, or shovel to do many other jobs h the same machine. *. . . Circle No. 217*

DEHYDRO

ANTI-STRIPPING ASPHALT ADDITIVE





Specializing in chemicals and services for industry

Regardless of surface or sub-surface moisture, you can have a permanent asphalt aggregate bond by using Dehydro.

ADVANTAGES:

1. **Dehydro** passes state, county and city tests.
2. **Dehydro** is manufactured on the West Coast assu ing a dependable supply and second morning d livery to the most distant West Coast area.
3. **Dehydro** is safe and easy to handle.
4. **Dehydro** maintains fluidity at temperatures as lo as 0° F.
5. **Dehydro**-treated asphalt aggregates rake easi and have a bright appearance.
6. **Dehydro** service engineers are always availab for consultation.

For complete information, write or call

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A DIVISION OF PETROLITE CORPORATION

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Phone Raymond 3-6541

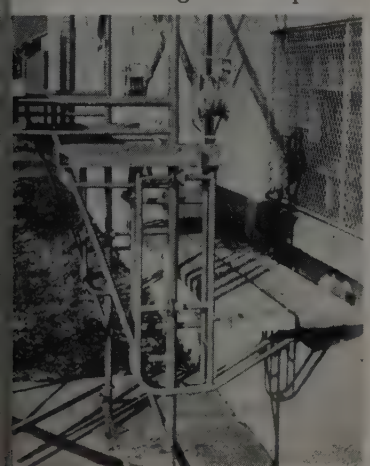
XD 57-11

. . . for more details, circle No. 64 on Reader Service Postc

unitized automatic aggregate batching plant has been de-ned by *Heltzel Steel Form and Iron Co.* engineers for high-y construction work. It sets up fast and dismantles quickly three easy-to-handle sections that can be transported by isting equipment without the need of special permits. This rticular batching setup includes the new Heltzel E-4 cement plant. This plant, with integrated elevator and twin batchers, is designed for fast on-the-job erection and easy handling. The entire plant is arranged "in line" so that batch trucks can drive straight through. All batching mechanism operates automatically, being actuated by the truck driver who touches a button without leaving the truck. *. . . Circle No. 218*

afety latch ecures scaffolding

Increased efficiency and reduced sts can be achieved by using The tent Scaffolding Co.'s improved



ason's Elevating Bracket with andard 5-ft. wide Trouble Saver ctional steel scaffolding. Brackets e mounted on frames next to all. They provide two platforms, ne for men and one for materials. oisting winches provide raising and lowering to correct working heights. New safety latch prevents scaffold from falling below next lower horizontal member in the event of mechanical failure while raising or using scaffold. Both mason's and the materials platforms hold two 10-in. planks for staging. *. . . Circle No. 219*

Fully-hydraulic winch up to 50% more efficient

A fully-hydraulic winch, that's up to 50% more efficient than conventional winches is being offered by **Teale and Co.** The new winch is powered by twin, heavy-duty, two-way hydraulic cylinders that transmit power directly to the drum drive-shaft. By eliminating all worm, spur or other gears, the winch also eliminates the big loss of mechanical efficiency associated with gears. As a result, to equal the performance of the Teale winch, with a 15-gal. per min. pump, a conventional unit would require at least a 70-gal. per min. pump and motor. Unlike conventional winches, the Teale operates at peak efficiency even at super-slow speeds. It develops 6,000 lb. of line-pull on

a bare drum, with positive power on the line both in and outgoing. The unit is only 18 in. wide by 17 in. high by 24 in. long, and weighs only 600 lb. It is available either with the Teale Versa-Lift truck mounted crane or separately. *. . . Circle No. 220*

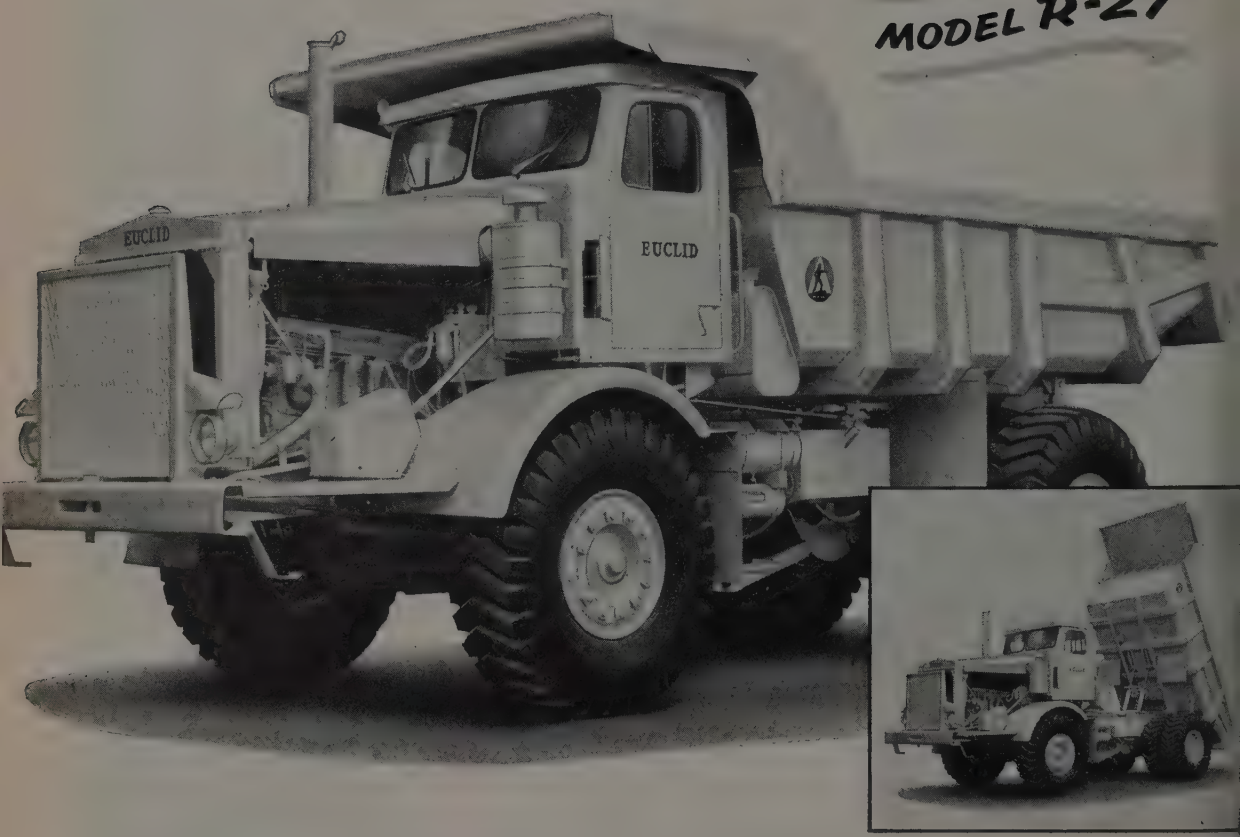
Leschen now supplying prestressed concrete strand

Leschen Wire Rope Division, H. K. Porter Co., Inc., is now producing high-strength, stress-relieved 7-

. . . for more details, adv. following pg., circle No. 65 on on Reader Service Postcard →

27 ton "EUC

MODEL R-27



325 or 335 h.p. . . . Torqmatic Drive . . . 18.00 x 25 tires

Model R-27 is a new size in the complete line of Euclid Rear-Dumps—rated payload is 54,000 lbs. This off-highway hauler incorporates the job-proved components which have made Euclid Rear-Dumps the outstanding choice of contractors, mines and quarries.

With either 325 h.p. GM diesel or 335 Cummins engine, the Allison Torqmatic Drive makes maximum use of the power for faster hauling cycles. Converter lock-up in the 4-speed Torqmatic permits 34 mph speed with full payload and efficient performance on long, high speed hauls.

Standard 18.00 x 25 tires on all four wheels assure the traction and load carrying capacity needed for moving 27-ton payloads on tough hauls. Standard body is rated at 18 cu. yds. struck —quarry type body is also available. The R-27 is equipped with oil retarder for safer, more economical braking on jobs with steep down-grades on the loaded haul.

See your Euclid dealer for detailed specifications on this new 27-ton Rear-Dump . . . it's a good example of the advanced design that makes Euclid your best equipment investment.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

REAR-DUMP

It's new...but JOB PROVED!

18.00 x 25 tires on all wheels permit better distribution of pay-
l. Rugged body and frame are designed to withstand loading,
ling and dumping big loads of heavy excavation year in and
r out. Quarry body is available for rock work.

Low loading height and good maneuverability of the R-27 increase the efficiency of loading equipment. Exhaust heated body for work with wet, sticky material is optional. Front and rear springs are thrust-mounted and free floating, with variable spring centers.

R-27 is equipped with dual steering jacks—one for each wheel
d an independent hydraulic system for steering. Oil retarder—
ntegral part of the Torqmatic Drive—permits faster safe travel
ds down grade and reduce brake maintenance cost.

Large capacity hydraulic pump and twin hoists have ample power to raise and dump the load fast. Mounting brackets for the two stage double acting hoists are an integral part of frame assembly. Comfortable, well insulated cab is offset for maximum visibility.

A COMPLETE LINE OF REAR-DUMPS—

10, 15, 18, 22, 27, 40 and 50 ton capacities, also semi-trailer models of 12, 22 and 35 ton payload—to fit any job

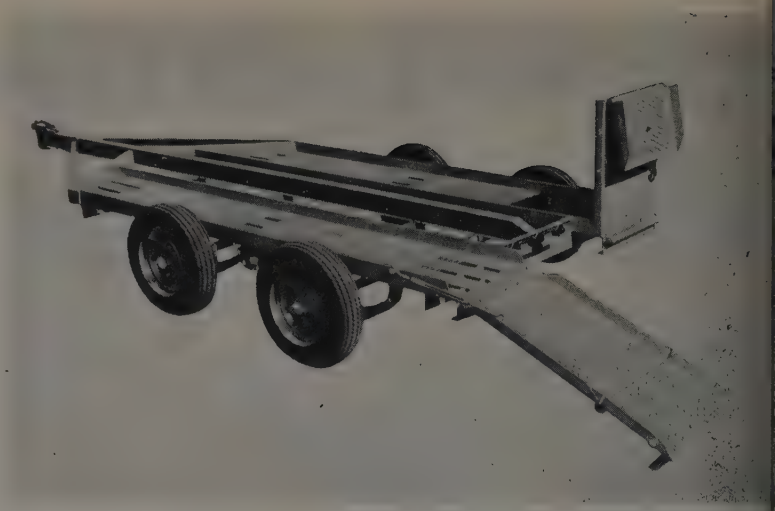
wire strand for prestressed concrete to help supply the needs of that rapidly expanding industry. A product that meets or exceeds ASTM and all state specifications is assured by the latest techniques of quality control both in the production of the wire and the manufacture and stress-relieving of the strand.

. . . Circle No. 221

Fast-Spiral masonry drill

Fast removal of drilled material is achieved by Fast-Spiral flutes that lead from *both* cutting edges of the carbide tip in a new drill manufactured by **Holub Industries, Inc.** This unique design permits drill to be used continuously in concrete, brick, stone and other masonry materials. It cuts clean and fast; packing and stalling are eliminated. The cutting tip is solid carbide and the shank is made of a special alloy steel. This combination assures more cuts with less sharpening, longer drill life and lower drilling costs. Drill sizes range from 11/64 in. to 1½ in. Each is individually packed in a plastic tube to protect the carbide tip when not in use.

. . . Circle No. 222



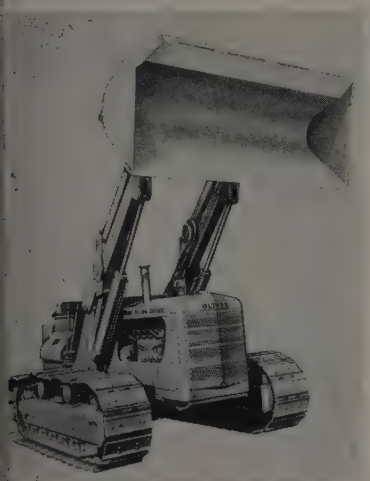
Tractor transport saves time and money

Moving a tractor, back-hoe, front-end loader, or fork lift is easy, safe and fast with a Haulette tractor-transport manufactured by the Haulette Division of **Fayette Manufacturing Co.** With this hauler, equipment is hauled out to the job-site with a light pickup truck. No slow, tedious driving that's hard on equipment and wasteful of man-hours. All you do is set the tractor-transport's brakes lower the steel ramps and roll on your equipment. Secure the ramps and you're ready to go through smooth city streets and highways or over rough country roads. Exclusive easy-glide design and true camber performance assures fast easier towing and greater safety by eliminating sidesway. Lengths range from 14 ft. to 20 ft. overall with bed lengths of 11 ft. to 15 ft. 3½ in. Loading widths are from 70 in. to 95 in.

. . . Circle No. 223

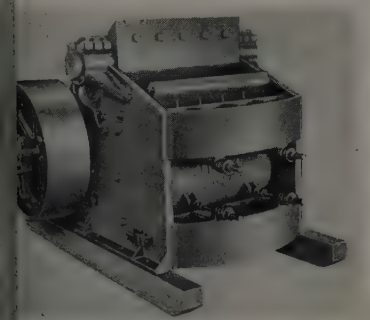
oader
eatures protected design

A brand-new loader with 2¼-yd. ucket capacity has been an- ounced by The Oliver Corp.



alled the OC-156, it is a com- letely integrated unit, with the ader matched to the full capa- lities of the powerful 110-hp. trac- r. The loader is rigidly mounted that the loads are taken directly the subframe, and the new, low- ofile design provides full visi- lity and low center of gravity for icker, fuller loading. Length of ck on the ground is 87⅛ in., th 2,788-sq. in. contact area to ve greater stability for fast and avy loading for which the OC- 6 is especially suited. An impor- nt feature is the fully protected sign of the loader. The hydrau- pump is located under the ra- tor and is engine-mounted. here are no hose connections to me loose, no exposed PTO. Deep, ll-length steel guards protect the lower track wheels.

. . . Circle No. 224

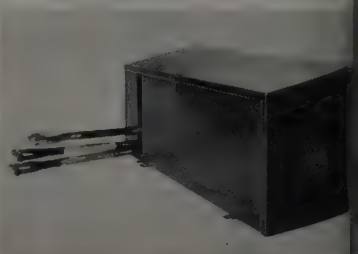


RE EATS the rock," is the way Kue- high capacity crushers are frequently cribed. A product of *Straub Mfg. Co.*, , these rockeaters are available in ca- ity ranges from 50 to 125 tons per r. Required horsepower is 40 to 60.

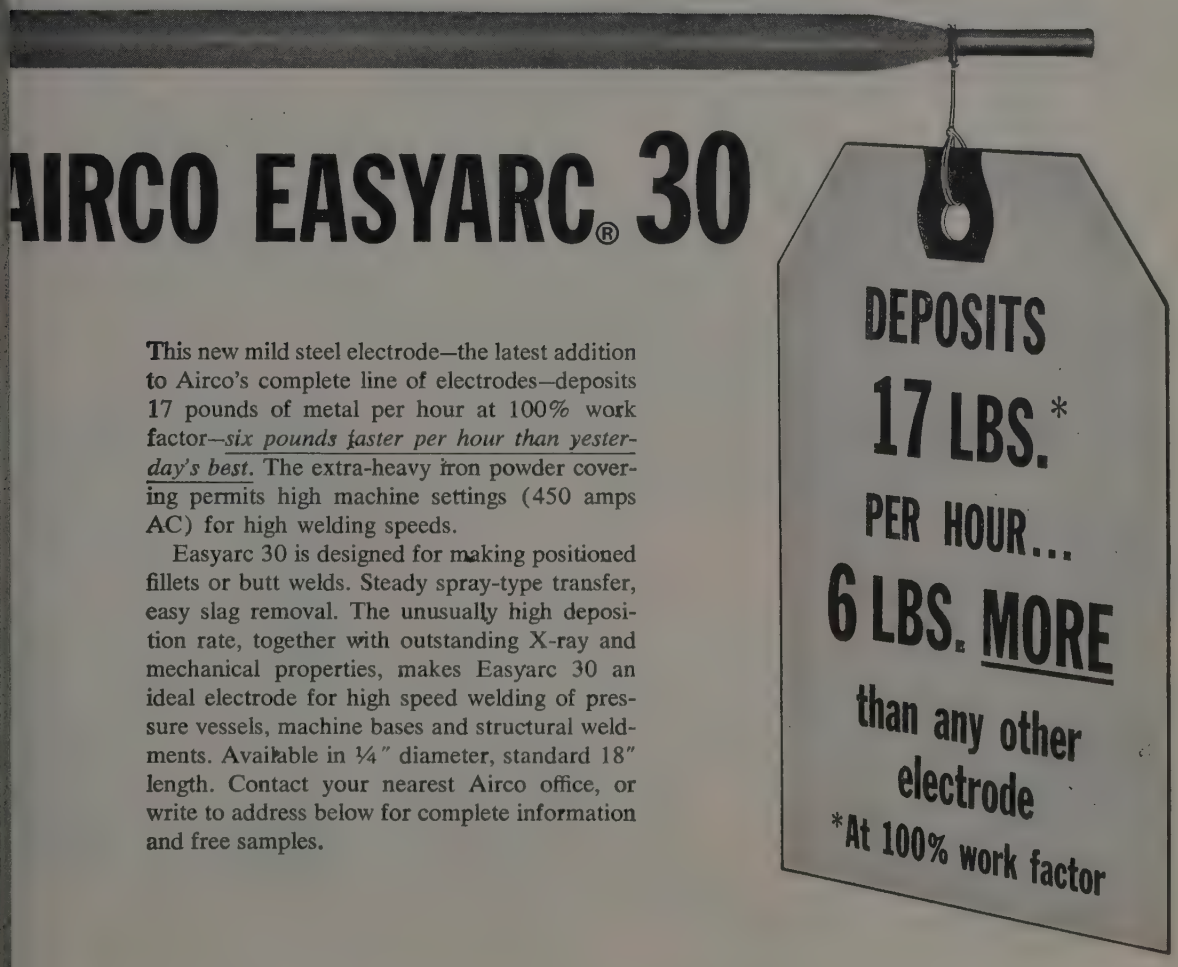
. . . Circle No. 225

Tool chest has handy shovel slo

An all-welded, 18-gauge steel too chest for storage of tools, equip ment, change of clothing and extra stock for job-site workmen is an nounced by **Scott-Rice Co.** Called Elmers Tool Chest and available in two sizes, the weight is sufficien to discourage easy removal. An ex tended flanged sloping top provide complete weather protection. A steel slot for "handle" tools per mits storage of six tools which can not be removed when top is locked



AIRCO ANNOUNCES THE FASTEST ELECTRODE ON THE MARKET



AIRCO EASYARC® 30

This new mild steel electrode—the latest addition to Airco's complete line of electrodes—deposits 17 pounds of metal per hour at 100% work factor—*six pounds faster per hour than yesterday's best.* The extra-heavy iron powder covering permits high machine settings (450 amps AC) for high welding speeds.

Easyarc 30 is designed for making positioned fillets or butt welds. Steady spray-type transfer, easy slag removal. The unusually high deposition rate, together with outstanding X-ray and mechanical properties, makes Easyarc 30 an ideal electrode for high speed welding of pressure vessels, machine bases and structural weldments. Available in ¼" diameter, standard 18" length. Contact your nearest Airco office, or write to address below for complete information and free samples.

AIRCO®

AIR REDUCTION PACIFIC COMPANY

SAN FRANCISCO • LOS ANGELES • PORTLAND • SEATTLE
Bakersfield • Burbank • Emeryville • Fresno • Inglewood
Phoenix • Sacramento • San Diego • Stockton • Tacoma

Western Headquarters for Oxygen, Acetylene and Other Gases . . . Carbide . . . Gas Welding and Cutting Machines, Apparatus and Supplies . . . Arc Welders, Electrodes and Accessories

r Reduction Pacific Company is a division of Air Reduction Company, Incorporated. Principal products of other divisions include: PURECO — carbon oxide — gaseous, liquid, solid ("DRY-ICE") • OHIO — medical gases and hospital equipment • NATIONAL CARBIDE — pipeline acetylene and lcium carbide • AIRCO — acetylenic chemicals • COLTON — polyvinyl-acetates, — alcohols, and other synthetic resins.

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

Removable trays and the shovel slot with angle irons are optional features. Angle iron for stilt mounting to allow full truck bed capacity is available. Chest height does not restrict the driver's rear mirror vision. *. . . Circle No. 227*

'58 Challenge Pacemaker truck mixer is here

The 1958 Challenge Pacemaker truck mixer has many new operational features that add years to the service life of the mixer and help the operator render better service. Features include a new water tank location which gives the driver full vision to the rear of the mixer. A recessed control panel is well protected and carries complete mixer operating instructions. A Uni lever gives driver complete operating control of the mixer from either the rear or truck cab. One lever starts, stops and reverses the drum—changes gear range and regulates the speed of the engine.

Hard-faced reinforcing flanges on mixing blades adds extra years of service life. The mixer is made in 17 different models. Front mounted separate engine models are made in 4, 5, 5½, 6, 6½, 7 and 8½-cu. yd. sizes. Rear mounted side engine models are made in 5½, 6, 6½ and 7-cu. yd. sizes. **Cook Bros. Equipment Co.** is exclusive world-wide distributor.

. . . Circle No. 228

Coated work gloves introduced by Riegel

A complete new line of neoprene vinyl plastic and rubber coated work gloves has been introduced by the industrial Glove Division of **Riegel Textile Corp.** The neoprene gloves are liquid-proof, resist acids, solvents, and caustics, and are recommended wherever heat, snagging

or cutting are a danger. The full coated vinyl plastic gloves are said to be three or four times more effective against oil than ordinary plastic gloves. In addition they offer protection against solvents and abrasives, superior finger dexterity and improved hand comfort. A positive grip, and excellent resistance to cutting, abrasions, heat and punctures are features of the natural rubber coated group. An illustrated catalog of the company entire glove line is available.

. . . Circle No.

with ESCO® CAST 12M SCRAPER CUTTING EDGES

ESCO cast 12M Scraper Cutting Edges will stop breakage on the toughest rock jobs and will outperform any other cutting edge.

They are cast in special alloy steel, *ESCO* 12M, and carefully heat treated for extremely high shock absorbing toughness and amazing resistance to wear.

ESCO is the toughest scraper cutting edge you can buy. Toughness to resist breakage and hardness to resist abrasion go *all the way through* the cutting edge.

Whether you are working rough rock or highly abrasive material keep your scraper equipment on the job with *ESCO* Cast 12M Scraper Cutting Edges. See your nearest *ESCO* dealer for details today.

ESCO®

ELECTRIC STEEL FOUNDRY COMPANY

2144 N. W. 25TH AVE. • PORTLAND 10, OREGON

MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.

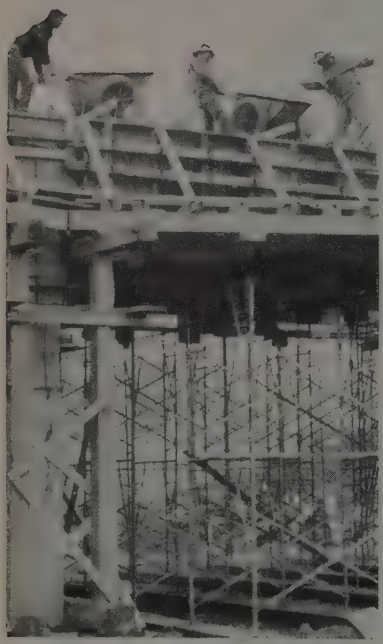
Offices in Most Principal Cities

ESCO INTERNATIONAL, NEW YORK, N. Y.

IN CANADA ESCO LIMITED

. . . for more details, circle No. 72 on Reader Service Postcard

Bridge Forming



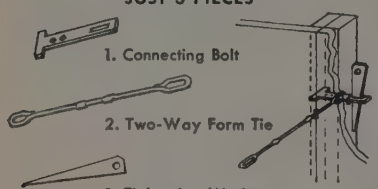
Symons Forms Cut 100 Days Off Bridge Forming Job

Ease of Erecting and Stripping Reduces Pouring Time

Contractor Lee Hoffman, Beaverton, Oregon, was given 320 days to pour 4,000 cubic yards of concrete for a bridge over Myrtle Creek in Oregon. Job was complete in 220 days or only ⅔ the time allotted.

Harry Pajutte, Chief Engineer for Hoffman, credits the ease of erecting and stripping Symons Standard High Strength Forms with contributing substantially to cutting pouring time, reducing number of men required on job, and providing greater mobility for the pouring equipment. Only

JUST 3 PIECES



3,144 square feet of panels were required for the 160,000 square feet of forming.

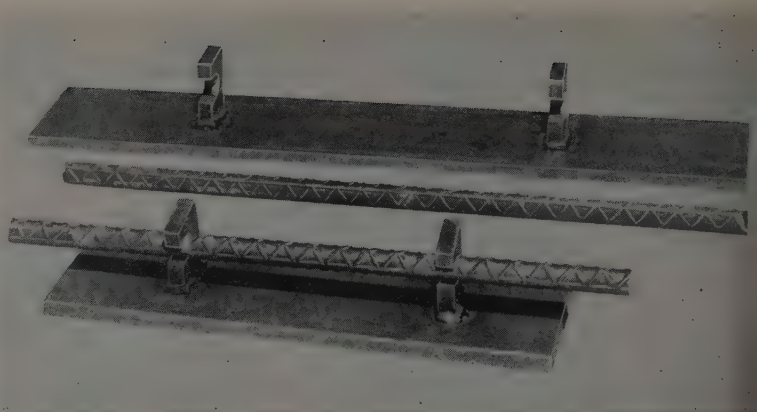
Symons Forms, Shores and Column Clamps can be rented with purchase option. Facts on Symons products and engineering service available upon request.

Symons

SYMONS CLAMP & MFG. CO.

634 Williams Street, San Leandro, California
Phone: LOckhaven 9-9159

. . . for more details, circle No. 73

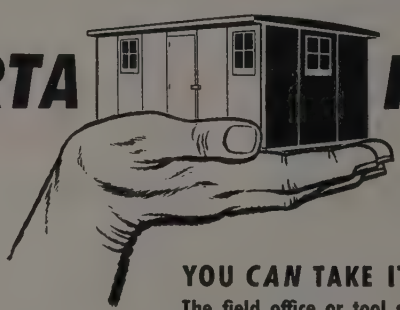


INSTALLATION of reinforcing bar up to ⅜ in. in diameter is speeded with a new end-welded stud, specifically designed for guniting and other concreting application by the *Nelson Stud Welding Division* of *Gregory Industries, Inc.* The new rectangular "Re-Bar" stud cuts costs of securing reinforcing bar to steel surfaces by eliminating both hand welding of fasteners and tying of bar. Studs are end-welded in a split second. The bar is placed in a "jaw" of the stud and is then locked into place with a couple of hammer blows. In standard dimensions, the new stud, designated Type R4L, measures ¾ in. wide and 3/16 in. thick. *. . . Circle No. 23*

Blacktop spreader attachment available for Payloader

A blacktop spreader attachment which lays down hot or cold mix asphalt in strips up to 8 ft. wide in a single pass is available for use with models HU, HH and HO Payloader tractor-shovels. Both Payloader and attachment are products of **The Frank G. Hough Co.** Attached to the Payloader this unit can work in close quarters where pavers and trucks can't operate. Uses include placing new pavement, resurfacing or patching streets, driveways, alleys, sidewalks, playgrounds, parking lots, etc. Al

PORTA HOUSE



YOU *CAN* TAKE IT WITH YOU!

The field office or tool shed that you can move on a pick-up truck. Pays for itself on the first job.

Quickly assembled and disassembled by unskilled labor.

SIZES: 9′ or 12′ widths—to any length (in 3′ modules)
(9x6, 9x9, 9x12, 9x15, 9x18, etc. — to any length)
(12x12, 12x15, 12x18, 12x24, etc. — to any length)

Light, watertight, strong.
Mass produced cheaper than you can build it!
Rental arrangements if you wish.
Write or phone collect.

AVAILABLE IMMEDIATELY

Plan to include Porta Houses in all future jobs.

PORTA HOUSE

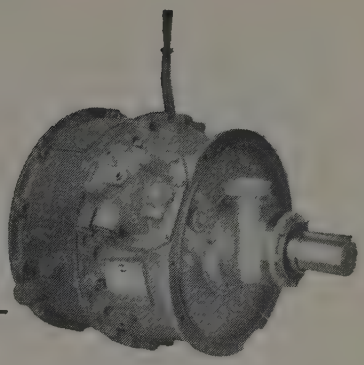
Manufactured and Distributed by
RIDGELY K. DODGE
6767 Broadway Terrace • Oakland 11, Calif.
OLympic 2-7237

. . . for more details, circle No. 74 on Reader Service Postcar

You asked for it—we built it

Allison announces

the TCDA-500 Power Shovel Special—



a new TORQMATIC Converter designed exclusively for power cranes, draglines and shovels.

Shovel operators are now convinced—a torque converter is the answer to faster work cycles—lower maintenance—higher profit on the job.

And now, Allison offers a new series of TORQMATIC Converters specially designed for power cranes, draglines and shovels. Compare these exclusive TCDA-500 features:

Exclusive TORQMATIC variable-capacity design makes available 8 converter combinations for Diesel engines from 150 to 335 horsepower by interchanging only four parts.

New positive-action over-center disconnect clutch eliminates working against clutch pedal pressure *at all times.*

Super-duty construction design stands long periods of idling without damage to the converter or clutch.

Triple roller-bearing output shaft design easily handles maximum sideloads.

Integral gear-type governor drive gives longer trouble-free life.

Extra-capacity fluid pump assures better oil cooling even in the heaviest duty service.

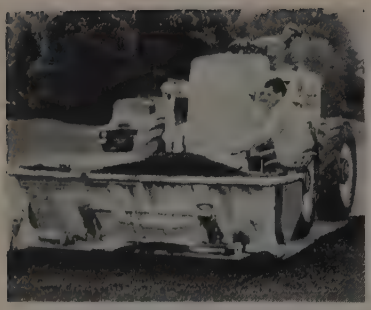
Take a tip from more than 80 manufacturers of 122 different kinds of construction equipment. Get the Allison TORQMATIC story.

Ask your equipment dealer, or write: Allison Division of General Motors, Indianapolis 6, Indiana.

Allison TORQMATIC

TORQMATIC® DRIVES

. . . for more details, circle No. 75 on Reader Service Postcard

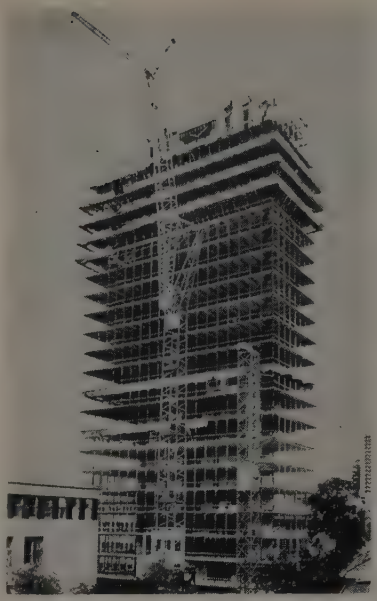


spreader operations are hydraulically controlled. Conveniently arranged levers give operator fingertip control of throttle, main feed gate, width adjustment to 8 ft. and thickness of spread up to 6 in. Spreader has a 2-cu. yd. capacity hopper.

. . . Circle No. 231

World's largest traveling crane

A slewing tower crane with a jib length of 100 ft. that can lift a 1½-ton load 332 ft. into the air (25 stories) and move under load, is the new wonder tool that **Beatty Scaffolds, Inc.** will introduce to Western construction. The giant crane was developed by Peine of West Germany. Despite the phenomenal height of the crane, its



stability and safety are unexcelled. Stress calculations on which dimensions of members and beams are based have been set well beyond permissible minimums. Automatic safety devices have been built in to control the jib load in every position. The crane will automatically switch off when the load on the hook is too great, when the hook is wound too high, when the jib is luffed too high or too low and when the crane approaches the end of the track.

. . . Circle No. 232

Put bite into that dozer

Any dozer blade can have a powerful bite with **Young Iron Works'** quick-change utility dozer tooth. Economically priced, the tooth can be mounted on the dozer

blade in a few minutes by means of a simple, positive clamp. The utility tooth saves time and money by adapting the regular dozer blade to short land-clearing and digging jobs encountered from time to time by almost all tractor operators.

. . . Circle No. 233

ONE OF A SERIES of advertisements to help the construction industry get better service from wire rope.

MAIN HOIST LINE

⅜" and ¾"	6 x 25F	PREformed Lang Lay Whyte Strand IWRC
	6 x 25F	PREformed Regular Lay Whyte Strand IWRC
⅞" and Larger	6 x 25F	PREformed Lang Lay Whyte Strand IWRC
1" and Larger	6 x 41F	PREformed Lang Lay Whyte Strand IWRC

*Where sheaves or drum diameters are less than 22 times rope diameter.

OVEL Chain, Electric, or Steam Crowd
1, 2, 3, Part or Twin Main Hoist Line

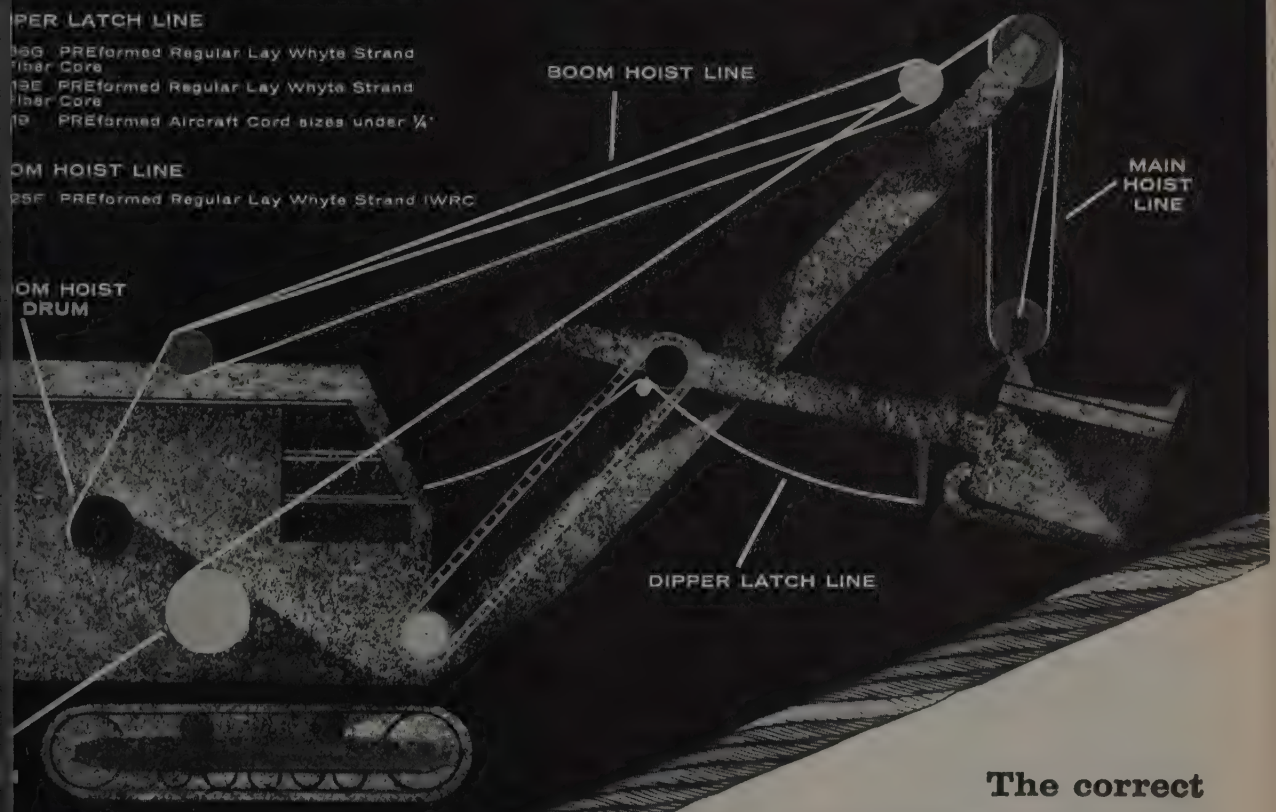
PER LATCH LINE

6G PREformed Regular Lay Whyte Strand Fiber Core
8E PREformed Regular Lay Whyte Strand Fiber Core
9 PREformed Aircraft Cord sizes under ¼"

OM HOIST LINE

25F PREformed Regular Lay Whyte Strand IWRC

OM HOIST DRUM



The correct Macwhyte wire rope will lower your yearly rope costs

You will make substantial savings in the amount of money you spend every year on wire rope for shovels — or any other equipment — if you use the right *type* of rope designed for your job.

Shown above are correct recommended wire ropes for use as main hoist line, dipper latch line, and boom hoist line on power-shovels. Each of the Macwhyte wire ropes listed is designed to shrug off the normal abuse, strain, and abrasion encountered in shovel service, and to offer exceptional service life.

Whyte Strand wire ropes are PREformed to eliminate any internal stresses in manufacture. This is particularly important in shovel service, where rough use and reverse bends subject *any* wire rope to severe flexing and bending strains as it curves around sheaves and drums.

In addition, every inch of Whyte Strand wire rope is internally lubricated. As the rope flexes, this enables adjoining wires to move by each other without wear, and extends the life of the rope. The tenacious lubricant also protects the exterior strands against moisture and corrosion.

Reeve up your shovels with Whyte Strand wire rope and watch rope costs drop!

103W

MACWHYTE Wire Rope COMPANY

MACWHYTE WIRE ROPE COMPANY
2913 Fourteenth Avenue, Kenosha, Wisconsin

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel, Plastic Coated and Nylon Coated Wire Rope, and Wire Rope Assemblies. Special catalogs available.

MILL DEPOTS: **Los Angeles 21,** 2035 Sacramento St., PH: TRinity 8383 **San Francisco 7,** 188 King Street, PH: EXbrook 2-4966 • **Portland 9,** 1603

WHERE TO BUY Gorman-Rupp Contractors' Pumps

These distributors offer the full line of Gorman-Rupp Contractors' Pumps. Most have rental service, too.

Andrews and Andrews Equip.
Portland

Andrews Equipment Service of Washington
Spokane

Bay Cities Equipment Co.
Oakland and San Jose

Brown-Bevis Industrial Equip. Co.
Bakersfield

The Harry Cornelius Co.
Albuquerque

Delta Tractor Co.
Stockton

Paul Droscher Sales
Redding

Faris-Moritz Equip. Co.
Denver

Flaherty Manufacturing Co.
Pocatello

Industrial Tractor Sales
N. Sacramento

The Lang Co.
Salt Lake City

Mid-State Truck & Mach. Co.
Wenatchee

Northern Commercial Co.
Seattle

Pacific Hoist & Derrick Co.
Seattle

Reno Equipment Sales Co.
Reno

Shasta Truck & Equip. Sales
Redding

Standard Machinery Co.
San Francisco

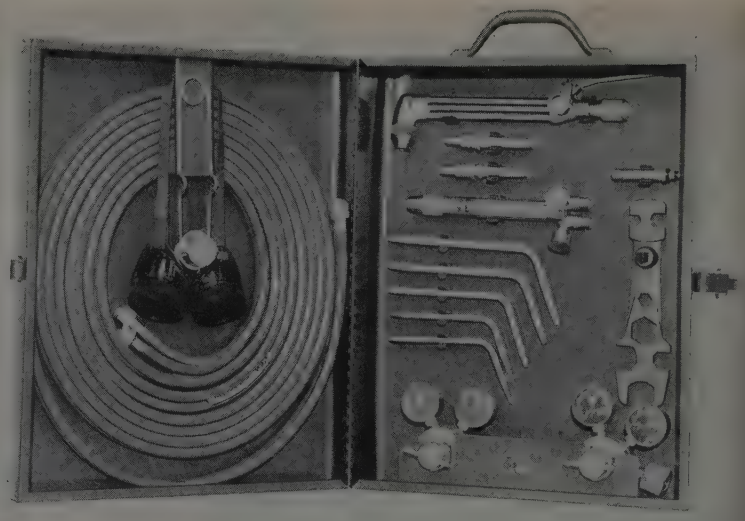
Starline Equipment Co.
Boise

Studer Tractor & Equip. Co.
Casper, Wyoming

Western Construction Equip. Co.
Billings and Great Falls

Western Equipment Co.
Portland and Eugene

. . . for more details, circle No. 78



Low-cost portable welding outfit does heavy jobs

Available at very low cost is a new packaged welding outfit, developed by the **K-G Equipment Co.**, an Air Products subsidiary. The unit combines high performance, versatility and dollar savings for those with occasional welding and cutting jobs as well as pipeliners, and construction, utility and service firms. The rugged, 12-lb. set includes all the necessary equipment for welding, cutting, brazing, soldering and heating. Capable of being carried under one arm, it cuts up to 4-in. armor plate. K-G offers a complete accessory and supply kit for the Redi-Set, including a wide selection of mild steel, hi-tensile steel and bronze welding metals with the proper fluxes.

. . . Circle No. 234

. . . for more details, circle No. 79

Air hammer gets into difficult spots

A short barrel for easier operation in blind spots or close quarters is a feature of a new heavy duty

air hammer, Model SP-600, produced by **Superior Pneumatic & Manufacturing, Inc.** SP-600 weighs 3 lb., is only 8 in. long, and is easy to handle. It has a metering trigger that lets the operator control blows from 0 to 3,500 per. min. with just light pressure from one finger. A patented safety chuck locks tools in six different positions. Air consumption is low—only 11 cfm. at 90 psi. The simple design of the SP-600 assures practically trouble-free operation and a minimum of repairs.

. . . Circle No. 235

News of DISTRIBUTORS

NEW BRANCH office and plant recently opened at 2411 Hewitt Ave., Everett, Wash., by Rental Machinery Co., a division of A. H. Cox & Co., of Seattle. Under the management of *William R. "Bill" Snyder*, the new outlet is set up to handle both equipment rentals and new equipment sales.

Halton takes on Ford Diesel Engine

Addition of the Ford Diesel Engine line is announced by E. H. Halton, president and general manager of Halton Tractor Co., Portland, Ore. Halton Tractor will serve as dealers in the Portland and Astoria areas. The line will be handled in Portland by E. G. Whitehead who has 20 years experience in diesel engine and marine engine application. Ray J. Wilkey, with 13 years of Caterpillar diesel experience, will handle sales in Astoria. Halton Tractor Co. is the Caterpillar dealer for northwest Oregon and southwest Washington, with stores in Portland, Astoria, Salem and Longview.

Expansion at Studer Tractor

Studer Tractor & Equipment Co., Casper, Wyo., has increased its sales staff by four new representatives: Russell G. Sage, Louis J. Lakse, B. M. "Bennie" Burtness, and Darryl C. Pickett. The sales department is managed by Harold J. Morrison, with Lloyd L. Hall, sales supervisor.

Studer was recently appointed distributor of the Hydra Hammer manufactured by Arrow Manufacturing Co., as well as for the asphalt paving and finishing equipment produced by Blaw-Knox Co. A further development which recently took place at this distributor's headquarters was the addition of 2,400 sq. ft. of storage space in the parts department and a 240-sq. ft. office addition.

Inland Diesel adds lines

Inland Diesel & Machinery Co., Spokane, Wash., has taken on two additional lines: Yale & Towne Trojan loader, and the Blaw-Knox line. President of the Inland organization is Al. Diskin. General manager is O. P. "Red" Martin; assistant general manager is Harold D. Davis. Ray Anderson, Jim Hargrave, and "Woody" Woods are salesmen.

Pettibone Mulliken names rep

L. G. McDonnel, Construction Machinery Co., Albuquerque, N. Mex., reports his company recently took on the construction equipment line manufactured by Pettibone Mulliken Corp., Chicago, Ill.

Treanor Equipment Co. moves

Treanor Equipment Co., Visalia, Calif., recently reported they have changed their operations to Texas, with stores at Abilene and Odessa. The Quinn Company has taken over Treanor's Visalia and Porterville stores, and Davies Machinery Co. has taken over the stores at Bakersfield and Delano.

Braman-Dickerson names Chase

C. D. Chase has succeeded Charles Bray as general manager of Braman-Dickerson Co., Riverside, Calif.

Howard Cooper adds two

Two additions have been made to the sales staff of Howard Cooper Corp., Portland, Ore., heavy equipment distributor. Both men come to Howard Cooper thoroughly experienced in operation, service, and

Ballard

Peters

sales of major lines of contractor equipment in the Pacific Northwest over the past ten years. Ray Ballard will handle sales of International Harvester, Hough, Galion, and other well known lines in the counties of Clark, Cowlitz, Klickitat, Skamania and Wahkiakum in Washington. He will operate out of the home office in Portland. Gordon Peters will also make his headquarters in Portland and handle the same lines in Marion, Clackamas, and part of Multnomah County in Oregon.

Trojan outlet in Alaska

Craig Taylor Equipment & Supply Co., Anchorage, has been appointed distributor for the entire Territory of Alaska for the Trojan line manufactured by The Yale & Towne Manufacturing Co. A full inventory of Trojan parts will be maintained by the new appointee.

Industrial Crane names Air Mac

Industrial Crane & Hoist Division of Borg-Warner Corp. announces the appointment of Air Mac, Inc. of Seattle as agent for the states of Washington, Oregon and Montana. This firm is well known in the Pacific Northwest as suppliers of materials handling equipment. Air Mac has offices in Seattle, Spokane, Tacoma, and Yakima, Wash.; in Portland and Eugene, Ore., and at Missoula, Mont.

A. H. Cox named American Hoist representative

A. H. Cox & Co., Seattle, Wash., has been appointed distributor in this area for the American Hoist

Lyle Ellert

& Derrick Co. of St. Paul, Minn. Lyle Ellert is assistant sales manager of the Cox firm and head of its Crane and Shovel Division.

Sedgwick takes on Maginniss line; appoints Western distributors

R. J. Sedgwick of Arcadia, Calif., announces he is now representative for Maginniss Power Tool Co., in addition to his other lines. The Maginniss company is manufacturer of Hi-Lectric vibrators, generators and vibratory back-fill and asphalt tampers. Sedgwick's area consists of the states of California, Nevada, Arizona and Utah.

During a recent swing through the West, Sedgwick, who is Western division manager for Ralph B. Carter Pump Co., has added new distributors in the following key areas: Southern California—Electric Tool & Supply Co., Los Angeles, and Kenton Equipment Co., San Diego; Northern California—F. Geremia & Sons Co., Sacramento, and Fox Nailer Corp., San Francisco; Northern Nevada—Sanford Tractor & Equipment Co., Reno; Utah—Western Machinery Co., Salt Lake City; Arizona—Western Machinery Co., Phoenix and Tucson.

Cook Belting takes on Raybestos-Manhattan's Poly-V Drive

Recently appointed as distributor for Raybestos-Manhattan's Poly-V Drive is H. N. Cook Belting Co., 401 Howard St., San Francisco. Cook Belting, engaged in the belt transmission business since 1860, has for a number of years been a distributor of R-M mechanical rubber and packing products. Their appointment as distributor of Poly-V, with their local stock of belts and sheaves, rounds out their extensive coverage of special transmission products.

Broderick & Bascom appoints O. C. Suppliers

Newest distributor for Broderick & Bascom Rope Co.'s Yellow Strand wire rope is O. C. Suppliers, Inc., 1980 Lake Ave., Huntington Beach, Calif. O. C. Suppliers is managed by J. Gordon Stebbings.

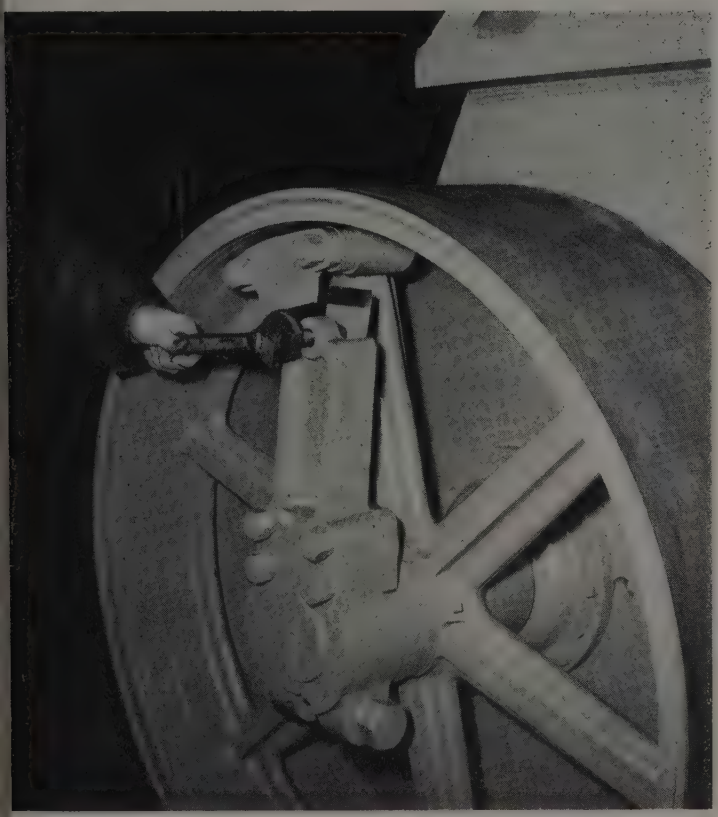
World's largest traveling crane introduced to West

Beatty Scaffolds, Inc., San Francisco, has taken on Western sales and distribution rights to the world's largest traveling crane and the heavy-duty Pecco horizontal shoring beams. Both are of German manufacture introduced in the United States by the American Pecco Corp., White Plains, N. Y.

Western rep has new address

S. A. Madrid, Western representative for Kolman Manufacturing Co. of Sioux Falls, S. D., is now located at 2910 Lawton St., San Francisco 22.

This KUE-KEN® automatic flywheel release saves you downtime and costly repairs



Tramp iron and overload can be damaging, but not to a Kue-Ken. If you have experienced broken frames or toggles with conventional crushers, then you will find in Kue-Ken an important savings advantage. On tramp iron or overload, Kue-Ken automatic control releases the flywheel and permits it to run free without ratcheting. On correction of the cause, the flywheel can be quickly reset and the crusher put back into operation without costly delays. It can be set to stop the motor automatically on release of flywheel or to sound an alarm. Kue-Ken gives the lowest cost per ton crushing. It has a built-in lubrication system with thorough lubrication that permits more crushing strokes per minute for greater capacity. Horsepower requirements are less. Regardless of your crushing requirements, see in the adjoining chart how a smaller, less costly Kue-Ken can provide the capacity you require.

Table of tons per hour that will pass through crusher with jaws set at dimension shown when measured in the closed position.

Table is based on crushing average hard, dry quartz or similar rock weighing at least 100 lbs. per cubic foot when crushed.

32 sizes available from 12" x 5" to 48" x 42".

Kue-Ken crusher size	¾"	1"	1¼"	1½"	2"	2½"	3"	3½"	4"	5"	6"	Horsepower range
24" x 12"	22	26	32	36	43	50	56					15 to 30
30" x 12"	32	35	38	42	55	70	76	85	110			20 to 30
36" x 10"	38	47	57	67	80	91	105					25 to 40
36" x 20"					70	82	90	115	135	160		30 to 50
42" x 25"					90	120	150	165	180	215	250	40 to 60

Write for Catalog

KUE-KEN® CRUSHERS

"CRUSHING WITHOUT RUBBING"

TRAUB MFG. CO., INC., 8389 Baldwin St., Oakland 21, Calif.

...w Crushers Gyratory Crushers Overhead Eccentric Crushers Revolving Screens
...assifiers Feeders Rib Cone Ball Mills Concentrating Tables Vibrating Screens

DEALERS:

SEATTLE, WASH.	Washington Machinery Co.
SALT LAKE CITY, UTAH	Lund Machinery Co.
SAN ANTONIO, TEX.	Closner Equipment Co.
PORTLAND, ORE.	Contractors Equipment Co.
LOS ANGELES, CALIF.	Garlinghouse, Fremon Co.
PHOENIX, ARIZ.	Stapley's
DENVER, COLO.	Union Supply Co.
CASPER, WYO.	Moss Equipment & Supply Co.
VANCOUVER, B. C.	Universal Equipment Co.

...nsylvania Crusher Division, Exclusive Licensed Eastern Manufacturer and Distributor, 323 S. Matlack St., West Chester, Penn.
...mstrong Whitworth (Metal Industries) Ltd., Authorized Licensed Manufacturer and Distributor. Close Works, Gateshead-upon-Tyne 8, England

. . . for more details, circle No. 82 on Reader Service Postcard

MURRAY McBRIDE (left), general sales manager of Columbia Tractor & Implement Co., Portland, Ore.; *Joe Vogel* (center), newly appointed Western Division representative for Sherman Products; and *Bob Blackwell*, Columbia Tractor's industrial sales manager, discuss features of equipment now in the light-industrial line of the distributing firm. Vogel succeeds *Jack Greenis*, previous Western zone manager for Sherman Products, manufacturer of backhoes, loaders, and fork lifts for attachment to the Ford tractor.

Bruschke joins Cramer

James Schriver, president of Cramer Machinery Co., announces the appointment of A. B. Bruschke as sales manager. Well known among the construction equipment fraternity of the Northwest, Bruschke comes to Cramer from Totem Equipment Co., where he was sales manager. The Cramer distributorship has offices both in Portland and Eugene, Ore.

Holds service school

More than a hundred Gradall owners, operators, and mechanics from Southern California recently attended a service school at Brown-Bevis-Industrial Equipment Co., Los Angeles. W. E. Burton, service manager, Warner & Swasey, Cleveland, Ohio, conducted the meeting along with R. E. Bechtel, Los Angeles district manager, and John Seibold, local representative.

The purpose of the school was to instruct equipment users in the latest maintenance and operation techniques.

New distributorship handling John Deere line

Announcement is made of the appointment of Sequois Machinery, Inc., of Visalia and Tulare, Calif., as the new John Deere dealer in those areas. This new distributorship is headed by Lloyd Kellner and Robert Eidson. Both men have a long and active association in the machinery industry.

Hawthorne Machinery expansion

New main store headquarters of Hawthorne Machinery Co. in San Diego, Calif., is fast nearing completion. Hawthorne is the John Deere distributor in this area.

Reno distributor moves into new quarters

Crooks Bros. Tractor Co., John Deere distributor at Reno, Nev., recently moved into new and enlarged headquarters.

Cox adds American Hoist

The A. H. Cox Machinery Co. of Seattle has taken on the distributorship of the products of American Hoist & Derrick Co. of St. Paul, Minn., effective in mid-March, according to E. E. Dionne, Cox president. The Cox company will handle American derricks, hoists, crawler and rubber mounted cranes and shovels and revolver cranes in the western Washington counties of Clallam, Jefferson, Lewis, Grays Harbor, Pacific, Thurston, Mason, Kitsap, Pierce, King, Snohomish, Skagit, Whatcom, Island, San Juan, Yakima, Kittitat, and Chelan. In addition to the main plant of A. H. Cox in Seattle, the company maintains branches in Tacoma, Everett and the Ballard district of Seattle.

Hatten takes truck mixer line

The line of truck mixers manufactured by Construction Machinery Co. of Waterloo, Iowa, has been taken on by Hatten Machinery Co. of Seattle, effective March 17, according to J. T. Hatten, president. The Hatten company has for some time been the Seattle distributor for products of the Construction Machinery Co., including hoists, pumps, concrete plaster and mortar mixers, but they did not heretofore carry a truck mixer line.

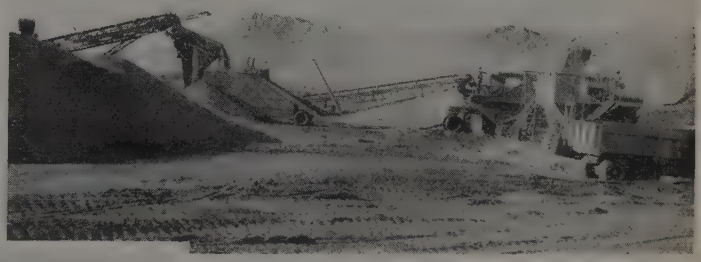
For Top Efficiency, Kiewit Uses Kolman Portable Plants in Minot

50'x42" Kolman Model 101 with SB-90 Vibrating Screen loads trucks with screened aggregate while scalping out oversize.

Series of Conveyor-Screen Plants Produces Variety of Aggregates

Using a series of **Kolman** Portable Conveyor-Screen Plants, Peter Kiewit Sons Co., Omaha, Nebr., produced the aggregates for paving the runways, taxiways, aprons and roads at the Minot, N. Dak., Air Force base with maximum efficiency and low cost.

The job called for 60,000 cu. yds. of concrete, 64,000 tons of asphalt mixes, 38,000 cu. yds of filter gravel and 300,000 cu. yds. of base and subbase materials.



In the gravel pits, a series of screening and crushing units produced a number of types of aggregate. On a typical setup, two Cat D-8 dozers were kept busy charging the reciprocating feeder-trap of a **Kolman** 50' x 42" Portable Conveyor. The 9'x54" **Kolman** Model SB-90 Vibrating Screen installed on the Conveyor passed all minus 1½-inch material to a storage pile and sent larger sizes on to a crushing setup.

Kiewit found **Kolman's** rugged construction took these heavy constant loads without a whimper. Maintenance expense was most nominal. Best of all, **Kolman** Conveyor-Screen Plants are attractively priced. Get the complete story before you buy any conveyor or screen.

SEE YOUR NEAREST KOLMAN DEALER

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

COLORADO
DENVER—Faris-Moritz Equipment Co.

IDAHO
BOISE, POCATELLO—Intermountain Equipment Co.

MONTANA
BUTTE, BILLINGS, GREAT FALLS and MISSOULA—Hall-Perry Machinery Co.

NEW MEXICO
ALBUQUERQUE—Construction Machinery Co.

NEVADA
ELKO—A-D Machinery Co., 251 W. Commercial St.

OREGON
PORTLAND—Balzer Machinery Co.

UTAH
SALT LAKE—Rasmussen Equipment & Supply Co.

WASHINGTON
SEATTLE—Sahlberg Equip., Inc. 5950 4th Ave. So.
SPOKANE—Intermountain Equipment Co.

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

ALASKA
FAIRBANKS, ANCHORAGE—The Carrington Co.

Western Representative
S. A. MADRID, 2910 Lawton St., San Francisco 22

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MANUFACTURERS

Pettibone appoints regional mgr.

Alex E. Ainlay, Western regional manager, is appointed by Pettibone Mulliken Corp., Chicago, to supervise sales and service in the eleven

Alex E. Ainlay

Western states and the El Paso area of Texas. He will headquarter in San Francisco's Balboa Building. Ainlay brings 30 years of heavy equipment experience to his new post. He was formerly a Pettibone district representative in Northern California.

Chain Belt acquires new paver

Chain Belt Co. has exercised its option and has acquired the designs and rights to manufacture and sell the Quad-City slip form paver. According to Chain Belt, this machine introduces the first new concrete paving technique in 30 years. Concrete is batched, mixed, and placed by conventional methods with the unique paver doing the rest. Developed by the Quad-City Construction Co., paving contractor of Rock Island, Ill., production will continue at Rock Island for the present.

Geller and Falck to new posts

Robert Falck has been made Western regional sales manager of Marion Power Shovel Co. Operating from headquarters in South

Robert Falck

San Francisco, Calif., he will represent Marion in California, Nevada, Utah and Arizona as well as parts of New Mexico and Idaho. At the same time announcement was made of the appointment of Mike Geller as assistant sales manager with headquarters at the home office.

Industrial Asphalt buys Empire

Industrial Asphalt of Los Angeles, Inc., nation's largest producer of asphalt paving materials, reports the purchase by them of Empire Asphalt Materials Corp., operating in the vicinity of Saugus and Newhall, Calif.

The Empire organization, headed by Fred Furnivall and Nick Hardesty, operated a new, modern Madsen, 5,000-lb. single batch, asphalt mixing plant. They sold it to devote their entire time to the rock business under the name of Saugus Sand & Gravel Co., and plan an immediate expansion of their rock crushing operations.

The asphalt plant operations will be under the supervision of Frank S. McGinnis, district manager of Industrial Asphalt in the San Fernando Valley. The acquisition of this new plant in Saugus makes a total of 27 owned and operated by the company in Southern California. The name of Empire will be immediately changed to Industrial Asphalt At Saugus, Inc.

Seymour joins P.C.A.

Daniel E. Seymour has been named district public relations representative for the Portland Cement Association, Seattle District Engineer Robert H. Lochow announces. Seymour, who was a Tacoma radio, television and wire service newsman for six years prior to late 1954, since has served in administrative and public relations capacities with the State government, and more recently has been in the service of Boeing Airplane Co. He will handle PCA's public relations throughout Washington and northern Idaho.

Anderson Steel Products, Inc.

Anderson Steel Products on Jan. 1 was incorporated into a new company, with D. R. Anderson as its president, and A. A. H. Anderson, vice president. A manufacturer of special paving breaker tools, as well as logging and rigging tools, the new corporation also acts as a distributor of Vulcan tools and Timken rock bits. Headquarters of Anderson Steel Products, Inc., are at 540 Brannan St., San Francisco.

R. H. Diller succeeds Barrows

Robert H. Diller has been promoted to the position of advertising manager of Austin Western Division, Baldwin-Lima-Hamilton Corp. He succeeds Howard F. Barrows, who recently retired. Diller has been a member of the Austin-Western organization since 1951.

Clark appoints special field reps

Special field representatives have been appointed by Clark Equipment Co.'s Construction Machinery Division to meet the growing needs of dealers since the Michigan line was extended to include heavy-duty earthmoving tractor dozers and scrapers. The Northwestern territory is assigned to John A. Halleran of Seattle. Halleran had been a construction superintendent in the Northwest for six years. Prior to that he was a sales representative for Western Tractor & Equipment Co. in Seattle. Other areas assigned field representatives are the Southeast and the Plains States.

Willys Motors' parts-service rep

A recent addition to the staff of Willys Motors, Inc., San Francisco, is Clifford H. White, according to James R. Beattie, Jr., Western divisional manager. White's position is that of divisional parts and service representative, working with

Lee Glodfelty, divisional parts and service manager, in the promotion of parts and service activities within the Western division.

Further expansion by Cummins

Cummins Service & Sales has expanded its Los Angeles property for the fifth time since it established headquarters at its present location in 1947. The newly acquired building with floor space of 5,200 sq. ft. adjoins the headquarters at 1661 McGarry St., and will be used as a warehouse and for the claims department, according to J. H. Flanagan, president.

Dodson named M-M parts manager

George D. Dodson, Western regional manager, Los Angeles, has been named parts manager of Minneapolis-Moline with headquarters at Hopkins, Minn., General Sales Manager Matt Carroll announces. Dodson has been a member of the manufacturing organization since 1930.

Clark Welding merges with Ko-Cal

Clark's Welding Works of Perkins, Calif., is combining operations with Koehring Company of California, a division of Koehring Company, it is announced jointly by John C. "Curt" Clark and Irving L. Gebhard, president and general manager of Ko-Cal. All Clark equipment and services are being transferred 50 miles to Koehring's plant at Stockton. The Clark products will retain their identity and production, and will be under the personal direction of Curt Clark, who becomes an executive of Koehring of California. This new affiliation is the culmination of years of cooperation between the two concerns and is designed to offer better service to the heavy construction industry, according to President Gebhard.

Personnel promotions at B-L-H

J. W. "Jack" Hardesty has been appointed general manager-sales of the Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Lima, Ohio. This promotion and several other key personnel changes at the Lima plant are announced by Henry Barnhart, vice president and general manager. Howard W. Read was named manager of parts and service and William Lutes as parts sales manager. Read will coordinate parts and service policies with Lutes and Robert Mallett, service manager.

Bethlehem Pacific promotes two

L. J. Soracco, manager of sales, Los Angeles district, for Bethlehem Pacific, has been appointed assistant to president, according to announcement by H. H. Fuller, president. S. B. Flora, formerly assistant sales manager, becomes the new district sales manager for the Los Angeles area. Soracco's career in the steel industry spans nearly forty years. He joined Pacific Coast Steel Corp. in 1918 before that company was acquired by Bethlehem in 1930. Flora joined the company's sales staff in 1945 in the Los Angeles district.

Wm. Miller chosen to head Western sales division

William J. Miller will supervise Thor Power Tool Co.'s construction equipment division sales for the Western half of the United States. He has been transferred from Dayton, Ohio, where he was a manager of the construction equipment division, to Thor's Aurora, Ill., sales headquarters. The move to Aurora is designed to consolidate the growing sales activities of the division.

Link-Belt Speeder reassigns two Western men

Two personnel changes recently took place in the Link-Belt Speeder Corp. organization. Charles F. Sweeney has been reassigned from district representative for the seven Rocky Mountain and Plains states to take over the Indiana-Ohio territory. W. B. Severe, formerly field service representative in the Pacific Northwest, has been appointed to handle Sweeney's former territory, making his headquarters at Denver, Colo.

PCA appoints new Bureau mgr.

Appointment of Gordon K. Ray as manager of the Highways and Municipal Bureau of the Portland Cement Association, Chicago, is announced. He succeeds Leo M. Arms, who was named technical adviser for the Bureau.

Leschen appoints Hartup

R. Rex Hartup has been appointed prestress planning engineer for Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis, Mo. He will serve as special consultant to manufacturers of prestressed concrete products.

United Concrete Pipe now operating Rockwin plant

United Concrete Pipe Corp., Baldwin Park, Calif., has assumed operational direction of Rockwin Prestressed Concrete Corp., according to announcement by Lloyd Earl, president of both United and Rockwin. Operations will continue under the Rockwin name, producing precast and prestressed concrete structural and building members. The Rockwin plant is located at 13440 E. Imperial Highway in Norwalk, near Los Angeles.

Caterpillar names market specialists

Two men have been appointed market specialists in the General Construction Market Section of Sales Development Division of Caterpillar Tractor Co., Peoria, Ill.: Andrew R. Timmerman and Trevor C. Roberts. Prior to joining Caterpillar in 1956, Timmerman was a sales representative for Alcoa. Roberts, who has been with Caterpillar since 1953, had previously been with A. L. Dougherty Construction Co. and Athey Products Co.

(Continued on page 147)

. . . for more details, circle No. 90 on Reader Service Card →

UNIT PRICES

Selected abstracts for Western projects

HIGHWAY—8.8 mi. of surfacing and 11 bridges in California

California—Nevada County—State. A $7,620,605 contract has been awarded to Fredrickson & Watson Construction Co. and Ransome Co. for 8.8 mi. to be graded and surfaced to provide a 4-lane divided highway, 11 bridges, highway lighting, steel sign structures, and a truck scale house with attendant facilities.

(1) Fredrickson & Watson Construction & Ransome Co. .$7,620,605
(2) McCammon-Wunderlich Co. & Wunderlich Const. Co. 7,884,076
R. A. Westbrook, Inc., & Morrison-Knudsen Co., Inc. 7,926,645
Macco Corp. 8,037,422

		(1)	(2)
Lump Sum	Removing bridges	$ 24,000.00	$ 23,500.00
Lump Sum	Clearing & grubbing	200,348.70	285,460.00
Lump Sum	Dev. wat. sup. & furn. wat. equip.	205,550.00	163,959.00
121,000 M gal.	Applying water	.10	.25
2,000,000 cu. yd.	Roadway excavation	.80	1.02
22,200 cu. yd.	Structure excavation	4.60	5.00
2,720 cu. yd.	Structure excavation, Type A	19.00	20.00
12,200 cu. yd.	Structure backfill	4.65	5.00
23,500 cu. yd.	Ditch & channel excavation	1.40	1.75
25,800,000 sta. yd.	Overhaul	.006	.005
360,000 ton	Imported subbase material	1.60	1.45
209,000 ton	Untreated base	1.67	1.45
230,000 sq. yd.	Mix. spread. & compact. C.T.S.	.25	.20
185,000 sq. yd.	Mix. spread. & compact. C.T.B.	.35	.20
22,350 bbl.	Portland cement	5.00	5.10
69 ton	Asph. emul. (pt. bdr. & fog sl. ct.)	75.00	47.00
185 ton	Lig. asph. MC-2 (cur. sl.)	82.00	43.00
269 ton	Lig. asph. SC-2 (pr. ct.)	51.00	40.00
3,319 ton	Par. asph. (P.M.S.)	7.00	35.00
53,500 ton	Min. aggr. (P.M.S.)	7.00	4.50
1,000 sq. yd.	Placing P.M.S. aprons & spillway downdrains	1.65	1.25
34,000 lin. ft.	Placing P.M.S. dikes	.27	.25
230 ton	Sand cover (pr. ct.)	7.00	7.00
35 ton	Asph. emul. (fine sl. ct.)	75.00	45.00
310 ton	Screenings (sl. ct.)	9.00	7.00
51,200 cu. yd.	CI. A conc. (pavt.)	18.40	19.00
33,700 ea.	Pav't tie assemblies	.53	.50
270 cu. yd.	CI. A. conc. (structures)	88.00	87.00
1,460 cu. yd.	CI. A. conc. (footing blocks)	36.00	53.00
Cont. Sum	CI. A conc. (bridges) (10,600 cu. yd.)	732,000.00	742,000.00
36 ea.	Furn. precast prestres. conc. gird. (54 ft. 6 in.)	1,150.00	1,130.00
36 ea.	Furn. precast prestres. conc. gird. (68 ft.)	1,525.00	1,740.00
72 ea.	Erect. precast prestres. conc. gird	200.00	165.00
61,200 lb.	Bar reinf. steel	.165	.13
Cont. Sum	Bar reinf. steel (bridges) (1.980.000 lb.)	290,000.00	283,000.00
2,965 lin. ft.	Furn. conc. piling	4.71	3.60
5,280 lin. ft.	Furn. steel piling	4.44	4.35
332 ea.	Driving piles	133.00	105.00
Cont. Sum	Struct. steel (2,775,000 lb.)	530,000.00	469,000.00
Lump Sum	Steel sign structures	30,000.00	40,000.00
213,500 lb.	Misc. iron & steel	.31	.35
984 lin. ft.	Steel railing	10.50	7.00
Lump Sum	Clean & paint stuct. steel	48,000.00	43,000.00
1,120 lin. ft.	Timber catwalk	3.20	3.00
1,360 cu. yd.	CI. A conc. (curbs & gutters)	42.00	40.00
175 ea.	R/W monuments	12.60	8.00
50 ea.	Survey monuments	12.00	13.00
1,800 cu. yd.	Light stone riprap	10.00	21.00
9,800 cu. yd.	Heavy stone riprap	6.00	6.00
85 cu. yd.	Sacked conc. riprap	44.00	50.00
3,950 ton	Cobblestones	3.60	3.00
9,088 lin. ft.	Metal beam bridge railing	6.60	7.00
1,663 lin. ft.	Metal plate guard railing	4.40	4.00
1,850 ea.	Gd. pst., mkr. & hor. ref. units	8.25	6.50
30,550 lin. ft.	72 in. chain link fence	2.00	1.75
110 lin. ft.	8 in. C.M.P. (16 ga.)	2.00	2.00
560 lin. ft.	12 in. C.M.P. (16 ga.)	3.20	3.00
5,450 lin. ft.	18 in. C.M.P. (16 ga.)	4.50	4.00
4,550 lin. ft.	24 in. C.M.P. (14 ga.)	6.30	6.00
680 lin. ft.	30 in. C.M.P. (14 ga.)	7.75	7.00
238 lin. ft.	36 in. C.M.P. (12 ga.)	12.00	11.00
244 lin. ft.	42 in. C.M.P. (12 ga.)	15.00	13.00
42 lin. ft.	42 in. C.M.P. (10 ga.)	19.00	16.00
146 lin. ft.	42 in. C.M.P. (8 ga.)	21.00	19.00
190 lin. ft.	48 in. C.M.P. (12 ga.)	18.00	16.00
252 lin. ft.	54 in. C.M.P. (12 ga.)	21.00	19.00
392 lin. ft.	60 in. C.M.P. (10 ga.)	28.00	26.00
106 lin. ft.	43 in. x 27 in. C.M.P. arch (12 gal.)	13.00	12.00

Improve Your Dragline Efficiency With a *Proved* New Bucyrus-Erie Bucket

This Bucyrus-Erie 1¼-cu. yd. medium-duty bucket is on a 30-B dragline excavating for a 30-in. sewer line.

Dragline owners have learned by experience how new-design Bucyrus-Erie buckets can improve the efficiency of their operations. Actual field service has also proved the extra strength and wearing qualities of the special lightweight BECOLOY from which these buckets are made.

PROVED Output — The proof of new Bucyrus-Erie dragline buckets is in their performance. They penetrate even toughest material quickly because weight is concentrated on teeth, cutting edge and thin "slicing action" lip. Material flows smoothly into the tapered basket — and is carried with a minimum of bobbing and spilling due to proper flaring and balance. Dumping is clean and fast.

PROVED Economy — Owners like these buckets not only for their superior performance, but for their light weight that means swinging more payload and less deadweight every hour, their maintenance-cutting resistance to impact and shock, and their long-wearing qualities. These mean real dollar-saving economy.

Your Bucyrus-Erie distributor listed below can help you select the right size and model of these *proved* new buckets to *improve* your operations. They are available for light, medium or heavy duty, with solid or perforated baskets. Bucyrus-Erie Company, South Milwaukee, Wisconsin. 44R58

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Border Machinery Company	El Paso, Tex.; Carlsbad, N.M.
Great Northern Tool & Supply Company	Billings, Mont.
The Colorado Builders' Supply Company	Denver, Colo. Casper, Wyo.
West Coast Engine & Equipment Company	Berkeley, Calif.
Clyde Equipment Company	Portland, Ore.; Seattle, Wash.
Crook Company	Los Angeles and Bakersfield, Calif.
R. L. Harrison Company, Inc.	Albuquerque, N. M.
Lang Construction Equipment Co.	Salt Lake City, Utah
Northern Commercial Company	Seattle, Wash. (Alaska)
Westmont Tractor Company	Missoula and Kalispell, Mont.
Road Machinery Company	Phoenix, Ariz.
Intermountain Equipment Company	Boise and Pocatello, Idaho; Spokane, Wash.
Sanford Tractor & Equipment Co.	Reno, Nevada

A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*

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42 lin. ft.	65 in. x 40 in. C.M.P. arch (10 gal.)	26.00	23.00
500 lin. ft.	72 in. x 44 in. C.M.P. arch (10 gal.)	28.50	25.00
14 ea.	Flar. end sec. for 12 in. metal pipe	31.00	21.00
18 ea.	Flar. end sec. for 18 in. metal pipe	45.00	30.00
27 ea.	Flar. end sec. for 24 in. metal pipe	68.00	46.00
4 ea.	Flar. end sec. for 30 in. metal pipe	100.00	57.00
2 ea.	Flar. end sec. for 36 in. metal pipe	150.00	107.00
1 ea.	Flar. end sec. for 42 in. metal pipe	225.00	175.00
2 ea.	Flar. end sec. for 48 in. metal pipe	260.00	211.00
1 ea.	Flar. end sec. for 43 in. x 27 in. metal pipe arch	130.00	90.00
1 ea.	Flar. end. sec. for 65 in. x 40 in. metal pipe arch	300.00	242.00
258 lin. ft.	108 in. field assem. plt. culv. (510-15)	70.00	66.00
40 lin. ft.	108 in. field assem. plt. culv. (57-15)	80.00	75.00
132 lin. ft.	108 in. field assem. plt. culv. (5 ga.)	88.00	82.00
62 lin. ft.	12 ft. 8 in. x 8 ft. 1 in. field assem. plt. arch (7 ga.)	100.00	89.00
126 lin. ft.	5 ft. 10 in. x 6 ft. 6 in. field assem. plt. ped. U.P. (12 gal.)	52.00	48.00
1,000 lin. ft.	8 in. P.M.P. underdrains	2.10	2.00
300 cu. yd.	Filter material	14.30	6.00
27 ea.	Entrance tapers for 8 in. downdrains	53.00	46.00
930 lin. ft.	8 in. C.M.P. downdrains	3.00	2.50
12 ea.	Downdrain slipjoints	36.00	31.00
50 ea.	Downdrain pipe anchors	36.00	27.00
11 ea.	Spec. slip joints for vert. drains	54.00	26.00
Lump Sum	Finishing roadway	15,000.00	13,500.00
384 lin. ft.	6 in. Dip. & wrap. weld. steel pipe (10 ga.)	3.00	3.50
1,500 lin. ft.	8 in. Dip. & wrap. weld. steel pipe (10 ga.)	3.50	3.50
295 lin. ft.	10 in. Dip. & wrap. weld. steel pipe (10 ga.)	4.00	4.50
150 lin. ft.	12¾ in. O.D. weld. steel pipe (¼ in. plate)	6.50	7.00
620 lin. ft.	6 in. clay sewer pipe (std. str.)	3.00	2.50
60 lin. ft.	6 in. clay sewer pipe (ext. str.)	3.50	2.50
960 lin. ft.	10 in. clay sewer pipe (ext. str.)	6.00	3.50
32 lin. ft.	Pipe shaft manholes	44.00	30.00
Lump Sum	Debris rack	400.00	522.00
Lump Sum	Highway light & sign illum. sys.	70,000.00	63,500.00
Lump Sum	Truck scale & weigh to graph	4,600.00	4,348.00
Lump Sum	Scale house & facilities	24,000.00	10,435.00
Lump Sum	Utilities & serv. conduit (Inspect. Sta.)	18,700.00	16,522.00

HIGHWAY—Construction of 11.8 mi. of highway in Arizona

Arizona—Gila County—Bureau of Public Roads. A $214,841 contract has been awarded to Heiskell Construction Co. for grading, base course, and bituminous surfacing of 11.8 mi. of Tonto forest, on the Verde Valley-Roosevelt Dam project.

(1) Heiskell Construction Co. $214,841
(2) Fisher Construction Co. 223,199
Tanner Bros. Construction Co., Inc. 234,556
Southwestern Engr. & Construction Co. 243,807

		(1)	(2)
Cont. Sum	Extra and miscellaneous work	$3,000	$3,000.00
4,000 cu. yd.	Selected borrow, topping, Case 1	.62	.60
300 cu. yd.	Stripping borrow pits, Case 1	.30	.45
190 cu. yd.	Excavation for structures	3.00	2.30
127,000 ton	Special subbase	.611	.62
5,000 yd. mi.	Overhaul of borrow, Case 1	.10	.20
11.682 mi.	Finishing previously constructed roadbed	300.00	1,400.00
7,400 M gal.	Water	1.45	2.00
Lump Sum	Providing and maintaining water plant or plants	7000.00	2,000.00
46,500 ton	Crushed aggregate base grading D (rev.)	1.12	1.05
1,000 ton	Stockpiled material, Section 200 grading D (rev.)	.90	.50
100 ton	Stockpiled material, Section 313, Grading A	3.50	3.25
470 ton	Asphalt, MC-2 or MC-3 Prime Coat	49.75	50.00
1,900 ton	Cover aggregate, grading A, type 3 seal coat	4.25	4.35
285 ton	Emulsified asphalt; grade RS-2 seal coat	49.50	50.00
11,700 lin. ft.	Shaping and compacting dykes	.18	.30
2,400 lin. ft.	Shaping and compacting gutter paving	1.80	.55
324 sq. yd.	Shaping and compacting outlet ditches	2.50	3.25
60 lin. ft.	8-in. galvanized corrugated metal pipe	2.58	2.50

30 lin. ft.	18-in. galvanized corrugated metal pipe	5.92	5.00
46 lin. ft.	24-in. galvanized corrugated metal pipe	7.67	6.00
64 lin. ft.	42-in. galvanized corrugated metal pipe	15.15	17.00
134 lin. ft.	Removing cleaning and relaying Salvaged Culvert Pipe	3.00	2.00
3 ea.	Spillway inlet assemblies Type A	35.00	50.00
2 ea.	Pine anchors for down drains	20.00	40.00
415 ea.	Removing and resetting metal Culvert markers and guide post	2.50	1.50

HIGHWAY — Construction of 6.2 mi. of highway in New Mexico

New Mexico—Sierra County—State. A $131,533 contract has been awarded to Haake Construction Co., Inc. for construction of 6.2 mi. on the Cuchillo-Winston road.

(1) Haake Construction Co., Inc. $131,533
(2) Mesilla Valley Construction Co., Inc. 148,592
Leslie Wheeler 159,894
Oliver J. Underwood 161,089

		(1)	(2)
Lump sum	Removal of obstructions	$ 700.00	$ 400.00
95,753 cu. yd.	Excavation — unclassified	.75	.42
6,310 M gal.	Watering	1.00	1.50
290 hr.	Rolling (tamping roller)	10.00	7.50
380 hr.	Rolling (pneumatic tired)	5.00	5.00
160 hr.	Rolling (steel tired)	6.00	7.00
400 hr.	Fifty (50) ton roller operation	10.00	10.00
266 hr.	Mechanical tamping	5.00	5.50
16,269 sta. yd.	Station yard overhaul	.01	.01
45,044 ¼-mi. yd.	Quarter mile yard haul	.04	.05
06,185 ton mi.	Ton mile haul	.065	.07
4.2 mi.	Obliterating old road	300.00	100.00
2 ea.	Cattle guard—24-ft. roadway	2,400.00	2,200.00
60 ea.	Right of way markers	7.00	7.00
2 ea.	Standard federal aid project type I markers, (6-in. diam.)	60.00	70.00
30 ea.	Treated timber warning posts, refl.	8.00	7.50
30,025 ton	Controlled gradation sub-base	.60	.52
12,600 ton	Base course	.75	.68
850 bbl.	Bituminous material, type MC-1	7.50	6.90
1,275 bbl.	Bituminous material, type 120-150	7.75	7.00
2,660 ton	Cover material	4.00	5.00
53 cu. yd.	Grouted rock retards	20.00	20.00
948 lin. ft.	Culvert pipe—24-in. diam.	7.50	6.85
54 lin. ft.	Culvert pipe—30-in. diam.	9.00	8.00
70 lin. ft.	Culvert pipe—36-in. diam.	12.00	11.25
168 lin. ft.	Culvert pipe—42-in. diam.	14.00	16.50
120 lin. ft.	Culvert pipe—48-in. diam.	16.00	20.50
94 lin. ft.	Culvert pipe—54-in. diam.	18.00	22.50
82 lin. ft.	Culvert pipe—60-in. diam.	24.00	24.50

HIGHWAY — Construction of 2.3 mi. in Arizona

Arizona—Pinal County—State. A $183,109 contract has been awarded to Western Constructors, Inc. for 2.3 mi. of highway. Work consists of grading, draining, select material, aggregate base, bituminous road mix and seal coat.

(1) Western Constructors, Inc. $183,109
(2) M. A. Dunlap, Contractor 183,383
San Xavier Rock & Sand Co. 187,731
Heiskell Construction Co. 190,907

		(1)	(2)
79,350 cu. yd.	Roadway excavation	$ .44	$ .47
2,500 cu. yd.	Drainage excavation	.50	.50
4,100 lin. ft.	Grader ditches	.06	.10
750 cu. yd.	Structural excavation	2.00	1.90
9,300 ton	Borrow (CIP)	.42	.40
Lump sum	Provide water supply	750.00	750.00
5,900 m gal.	Apply water (CIP)	2.00	2.00
1,100 hr.	Rolling	8.00	8.50
35,800 ton	Select material (CIP)	.50	.40
9,300 ton	Aggregate base (CIP)	.95	1.10
725 ton	Cover material for seal coat (type B) (CIP)	6.50	6.50
6,600 ton	Bituminous mix (Cl. I-Rd. mix) (CIP except cost of liquid asphalt)	1.60	1.26
275 ton	Liquid asphalt for bituminous mix (Gr. MC-2 or MC-3) (CIP)	56.00	48.00
120 ton	Liquid asphalt for prime coat (Gr. MC-2 or MC-3) (CIP)	57.00	49.00
24 ton	Liquid asphalt for tack coat (Gr. MC-2 or MC-3) (CIP)	95.00	91.85
85 ton	Emulsified asphalt for seal coat (Gr. B) (CIP)	58.00	49.25
220 cu. yd.	Class A concrete (CIP)	53.00	54.50
25,200 lb.	Reinforcing steel (bars) (CIP)	.15	.20
650 lin. ft.	24-in. C.M.P. (CIP except excav.)	6.00	6.10
80 lin. ft.	30-in. C.M.P. (CIP except excav.)	7.50	8.00
652 lin. ft.	36-in. C.M.P. (CIP except excav.)	12.00	13.50
96 lin. ft.	54-in. C.M.P. (CIP except excav.)	20.00	16.50
114 lin. ft.	60-in. C.M.P. (CIP except excav.)	28.00	26.50
16 lin. ft.	22-in. x 13-in. arch type C.M.P. (CIP except excavation)	6.00	4.00
Lump sum	Miscellaneous removal and other work	5,000.00	(6,004.00 (2,364.60
1 ea.	Cattle guard 3-unit (std. C-14) (CIP except excav. & concrete)	1,000.00	1,430.00
1 ea.	Cattle guard 6-unit (std. C-14) CIP except excav. & concrete	2,000.00	2,500.00
100 lin. ft.	Road guard for bridges (Std. C-7) (CIP)	5.25	6.50

43 ea.	Guide post (std. C-80) (type "BR") (CIP)	8.00	6.50
22 ea.	R/W markers (std. C-1) (type B or C) (CIP)	10.00	8.20
18,500 lin. ft.	Line fence (std. C-16) (CIP)	.25	.21
2 ea.	Steel fence gates (type No. 1) (CIP)	65.00	67.50
205 lin. ft.	Single curb (std. C-20) (type G) (CIP)	2.10	3.00
4,900 lin. ft.	Placing bituminous mixed curbs	.18	.14
238 lin. ft.	Placing bituminous mixed gutters	1.50	2.10

HIGHWAY — Construction of 13.6 mi. of highway in California

California—Solano and Yolo Counties—State. Gordon H. Ball, Gordon H. Ball, Inc., and Ball & Simpson has received a $2,576,412 contract for two lanes (13.6 mi. in length) of an ultimate 6-lane freeway to be graded, frontage roads and approaches to be graded and surfaced with P.M.S. on U.B. and reinforced concrete bridges to be constructed.

(1) Gordon H. Ball, Gordon H. Ball, Inc., and Ball & Simpson $2,576,412
(2) A. Teichert & Son, Inc. 2,667,590
Harms Bros. 2,757,770
John Delphia & Fred J. Early, Jr. Co., Inc. 2,815,732

		(1)	(2)
Lump sum	Remov. conc. structures	$ 10,000.00	$ 8,800.00
Lump sum	Clearing and grubbing	100,000.00	126,272.81
Lump sum	Dev. water supply and furn. water equipment	122,000.00	96,000.00
64,000 M gal.	Applying water	.10	.10
422,000 sq. yd.	Compact. orig. ground	.05	.04
60,000 cu. yd.	Roadway excavation	.45	.50
2,500 cu. yd.	Structure excavation, type A	10.00	10.00
11,750 cu. yd.	Structure excavation	2.50	2.20
7,600 cu. yd.	Structure backfill	3.50	3.75
27,000 cu. yd.	Ditch and channel excavation	.80	.76
1,000,000 cu. yd.	Imported borrow	.60	.89
205,000 ton	Imported subbase material	.91	1.10
58,000 ton	Untreated base	1.20	1.75
67 ton	Asph. emul. (pt. bdr. & sl. ct.)	50.00	42.00
154 ton	Liq. asph. SC-2 (pr. ct.)	37.00	40.00
935 ton	Pav. asph. (P.M.S.)	6.50	6.00
18,500 ton	Min. aggr. (P.M.S.)	6.50	6.00
205 sq. yd.	Pla. P.M.S. spillway dndrn. and aprons	1.00	2.00
3,700 lin. ft.	Pla. P.M.S. dikes	.20	.22
520 ton	Sand cover (pr. ct.)	5.50	6.00
770 cu. yd.	Cl. A conc. (footing blocks)	30.00	30.00
2,100 cu. yd.	Cl. A conc. (structures)	55.00	55.00
Cont. sum	Cl. A conc. (bridges) (6670 cu. yd.)	425,000.00	422,000.00
4,182 lin. ft.	Conc. railing	7.00	6.70
900 lin. ft.	Rubber waterstops	6.50	2.80
242,000 lb.	Bar reinf. steel	.13	.14
Cont. sum	Bar reinf. steel (bridges) (1,727,000 lb.)	215,000.00	240,000.00
16,340 lin. ft.	Furn. conc. piling	4.00	3.80
1,440 lin. ft.	Furn. steel piling	4.25	4.60
600 ea.	Driving piles	77.00	77.00
23,000 lb.	Misc. iron and steel	.34	.37
97 cu. yd.	Cl. B conc. (curbs and gutters)	50.00	42.00
167 ea.	R/W monuments	7.00	7.60
73 ea.	Survey monuments	20.00	20.00
530 cu. yd.	Sacked concrete riprap	30.00	35.00
646 lin. ft.	Metal plate guard railing	4.00	4.40
1,312 lin. ft.	Metal beam bridge railing	7.00	6.75
560 ea.	Gd. pst., mkr., & hor. refl. units	7.00	7.00
5 mi.	New property fence	2,100.00	2,400.00
14 mi.	Freeway fence (metal posts)	3,600.00	3,400.00
14 mi.	Freeway fence (wood posts)	2,000.00	2,150.00
24 ea.	10-foot property fence gates	50.00	55.00
12 ea.	16-foot property fence gates	65.00	60.00
272 lni. ft.	12-in. R.C.P.	3.00	2.70
744 lin. ft.	18-in. R.C.P.	4.50	4.40
5,752 lin. ft.	24-in. R.C.P.	5.50	6.00
648 lin. ft.	30-in. R.C.P.	7.00	7.90
528 lin. ft.	36-in. R.C.P.	9.50	10.30
3,188 lin. ft.	24-in. R.C.P. (rubber gasketed)	7.00	7.00
412 lin. ft.	30-in. R.C.P. (rubber gasketed)	9.50	9.00
268 lin. ft.	48-in. R.C.P. (rubber gasketed)	17.00	17.00
15 ea.	Precast flar. end sec. for 18-in. conc. pipe	45.00	70.00
95 ea.	Precast flar. end sec. for 24-in. conc. pipe	56.00	93.00
12 ea.	Precast flar. end sec. for 30-in. conc. pipe	90.00	137.00
2 ea.	Precast flar. end sec. for 36-in. conc. pipe	160.00	214.00
144 lin. ft.	18-in. C.M.P. (16 gal.)	4.20	4.00
76 lin. ft.	24-in. C.M.P. (14 gal.)	6.50	6.00
306 lin. ft.	30-in. C.M.P. (14 gal.)	8.00	7.60
84 lin. ft.	30-in. C.M.P. (8 gal.)	15.00	14.60
84 lin. ft.	36-in. C.M.P. (12 gal.)	14.00	13.10
2 ea.	18-in. automatic drainage gates	55.00	80.00
1 ea.	24-in. automatic drainage gates	66.00	110.00
8 ea.	30-in. automatic drainage gates	125.00	180.00
263 lin. ft.	6-in. welded steel pipe (12 gal.)	3.00	4.10
1 ea.	Entrance taper	50.00	60.00
22 lin. ft.	8-in. C.M.P. downdrains	2.50	3.00
Lump sum	Finishing roadway	1,000.00	13,400.00
4 lin. ft.	Pipe shaft manhole	35.00	33.00
Lump sum	Electrical equipment	700.00	550.00

Manufacturers

(Continued from page 141)

Jamison purchases Albin plant

The Albin Manufacturing Company of Seattle, manufacturer of logging and construction equipment for shovels, back hoes and similar machinery, was purchased shortly after the first of the year by Scott Jamison of Seattle from the estate of the late Albin Erickson, the company's founder, and has now resumed full operation. Jamison is well known in the construction equipment business in Seattle, having been for ten years associated with the A. H. Cox Co. His father was president of the Cox company before his retirement a year ago.

New Omark service department formed

Art Gredler has been appointed service manager for the Fastening Division of Omark Industries, Inc., Portland, Ore., John D. Gray, president, announces. Gredler will establish and head a newly created service department. Prior to joining Omark, Gredler served as service manager for McCulloch Motors where he was employed for more than eleven years.

D. O. Day heads new Atlas Copco sales office

David O. Day will head up a new Atlas Copco Pacific Inc., construction equipment sales office at Seattle, covering western Washington and Portland, Ore. Day has been in the Spokane district office since mid-1951 for Atlas Copco, manufacturer and distributor of pneumatic equipment and drill steels.

New Northern California sales representative

C. E. Boston has been appointed general markets sales representative for Northern California and western Nevada, it is announced by F. G. Fabian, Jr., general manager, Dresser Manufacturing Division, Bradford, Pa., one of the Dresser Industries, Inc.

Massey-Ferguson Division top level appointments

Top level appointments have been made by C. J. Davis, division general manager of the Massey-Ferguson Industrial Division, Wichita, Kans. John W. "Jack" Pogson, has been named industrial sales manager for the Denver branch. He will be responsible for service and sales for industrial products in Colorado, New Mexico, southern Wyoming, and parts of Texas, Nebraska, and Kansas. La Von Jones was appointed industrial sales manager of the branch at Pocatello, Idaho, and will be responsible for the area of Idaho, Utah, and eastern Nevada.

Appointed to head the Stockton, Calif., branch as industrial sales manager is Bruce MacLellan, Jr. John D. Luck becomes industrial sales manager for the Los Angeles sub-branch. Guy R. Smith will serve as industrial technician at Stockton, and Robert M. Prescott as product technician at Los Angeles.

Personnel changes in A-C Tractor Group personnel

Several personnel changes recently took place in the Western branches of the Tractor Group of Allis-Chalmers Manufacturing Co. R. G. Mitchell, construction machinery sales manager at the Los Angeles branch, was appointed to the newly created position of branch manager at the Construction Machinery Division in Portland, Ore. E. S. Harrison, construction machinery salesman at Portland, and O. A. Williams, construction machinery sales manager at Billings, Mont., were named sales managers for the Portland branch.

S. C. Skiman, construction machinery sales manager, Oakland, has been appointed to the recently created position of Oakland branch manager for the Construction Machinery Division, and D. F. Bryant is named sales manager for this branch. Bryant was assistant construction machinery sales manager at Los Angeles.

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