STERN
NSTRUCTION

JULY 1959

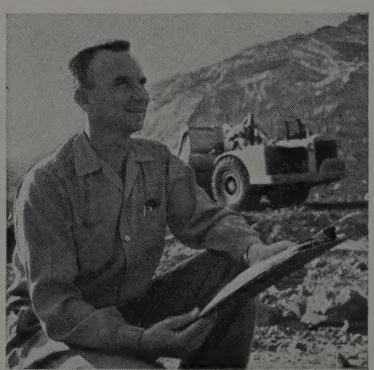
ENGINEER'S FIELD REPORT

PRODUCT RPM DELO OIL

FIRM Silva & Hill Construction Los Angeles, Calif.

5,000 hours at 2,000 rpm before overha

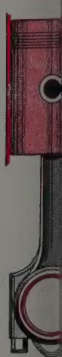
Working at 2,000 rpm speeds in heavy dust, Silva & Hill Construction Co. operates 8 Caterpillar DW-21s (like one above) five days a week removing 3,500,000 cu. yds. of dirt and rock for Burbank golf course. Firm reports RPM DELO OIL keeps these units rolling an average of 5,000 hours before major overhaul. Says Maint. Supt. H. C. Basin "We've got 39 diesel-powered machines workin beat a one-year deadline. Any unexpected delay c plenty. That's why we stick with 'DELO'. It's pr it will keep equipment rolling longer without en breakdowns or repairs."



Lubricated with RPM DELO OIL, this Caterpillar D-8 Tractor (left) turned in 10,000 hours, bulldozing and pulling sheepsfoot rollers, before major overhaul. Frank W. Hill (right) Silva & Hill partner, reports: "We've used RPM DELO OIL in all our diesel units since 1940. It has really paid off in keeping our equipment in top running condition."

Why RPM DELO Oils redu wear—prolong engine life

- Oil stays on engine parts—hot or cold, running or idle
- Anti-oxidant resists lacquer formation
- Detergent keeps parts clean
- Special compounds prevent corrosion of bearing metals
- Inhibitor resists crankcase foaming.



For More Information or the of your nearest distributor, w or call any of the companies be

LUBRICATING OILS RPM DELO

TRADEMARKS "RPM DELO" AND CHEVRON DESIGN REG. U.S. PAT. OFF.

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THE CALIFORNIA COMPANY
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STANDARD OIL COMPANY OF T
P. O. Box 862 • El Paso, Texa

. . . for more details, circle No. 1 on Reader Service Pos

A ROCK SHOVEL has to be BUILT THAT WAY!

The recognized superiority of Northwest Shovel performance in rock didn't just happen. A *real* Rock Shovel has to be built that way. Northwest Shovels were engineered to handle rock digging at its worst and Northwest advantages in rock mean greater output in easy digging.

The qualities that make Northwest outstanding in any type of digging are easy to check. Start with the model you are interested in from the big 80-D 2½ yd. rig down to the workhorse of the ¾ yd. field, the Model 25.

Booms, rugged and powerful, Sticks of heavy section, the Northwest Dual Crowd—a Crowd that gives you crowding force most other Independent Crowd Shovels waste! This simple crowd with its additional crowding force makes it possible to handle harder digging and more yards per hour—per day—per month!

Other advantages—the Cushion Clutch eliminates shock overloads before they can reach operating machinery—the Feather-Touch Clutch Control assures ease of operation and gives the "feel-of-the-load" free from the complications of compressors, tubing and other delicate mechanisms, Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and make spotting heavy loads easier—these are just a few of the many features that combine to assure performance in any digging—features that have made Northwest the recognized leader in rock work.

NORTHWEST ENGINEERING COMPANY
135 South LaSalle Street, Chicago 3, Illinois

Perhaps Rubber Tired Equipment will do your job better. The Northwest Truck Crane brings you a combination of advantages found in no other similar machine. 25 and 35-ton capacity.

NORTHWEST . . . always ready to GO!

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CALIFORNIA: Southern Equipment & Supply Co., SAN DIEGO
IDAHO: Arnold Machinery Company, Inc., BOISE & IDAHO FALLS
NEVADA: Sierra Machinery Co., Inc., RENO
OREGON: Balzer Machinery Company, PORTLAND
OREGON: Cal-Ore Machinery Co., Inc., MEDFORD
UTAH: Arnold Machinery Co., Inc., SALT LAKE CITY
WASHINGTON: General Machinery Company, SPOKANE
WASHINGTON: Mid-State Truck & Machy Co., WENATCHEE
ALASKA: Bashaw Equipment Company, Anchorage & Fairbanks

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1234 Sixth Ave. South

Call your local Northwest Sales Agent

WESTERN CONSTRUCTION

KING PUBLICATION

JULY
1959
Vol. 34 No. 7

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FRONT COVER—View from inside the second barrel of the Colorado River Aqueduct shows Pipemobile approaching with a 63-ton pipe section. Story starts on page 27.

Published monthly by
KING PUBLICATIONS
609 Mission Street
San Francisco 5, Californ
Phone: YUkon 2-4343

James I. Ballard . . . . Presid
L. P. Vrettos . . . . Vice Presid
and General Mana
Jack R. Vanneman . Vice Presid

★

Subscription rate is $10.00 per y
$12.50 in foreign countries. Cost
single copy is $1.00. Cost per si
copy of Construction Equipment Di
tory, published each January, is $5
Every regular qualified recipient
Western Construction receives a c
of the Construction Equipm
Directory bound into the January is
Accepted as Controlled Circula
publication at Portland, Oregon. P
master: Please send Notice 3579
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For 33 years serving the construction needs of the Western States

A steel mattress for concrete roads...

Clinton Welded Wire Fabric

The Image of CF&I—a giant steelman—represents the years of research and experience that produce such modern steel products as Clinton Welded Wire Fabric. Today, highway engineers specify the use of this steel fabric to add extra strength and long life to concrete roads.

CF&I-Clinton Welded Wire Fabric helps cushion the impact of fast-moving traffic by spreading heavy stresses horizontally.

In addition, cracking which may occur during the setting period is held to a minimum by CF&I-Clinton Welded Wire Fabric. And reinforced roads last longer because they are not prone to heaving due to extreme temperature changes. Should a tiny crack develop the fabric holds it tightly together, preventing expansion of the fissure.

If your aim is better highway construction, contact the nearest CF&I office before starting your next job. One of our engineers will be glad to discuss your reinforcing requirements with you.

CLINTON
WELDED WIRE FABRIC
THE COLORADO FUEL AND IRON CORPORATION

CF&I STEEL

In the West: THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N.M.) • Ft. Worth • Houston Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita

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. . . for more details, circle No. 8 on Reader Service Postcard

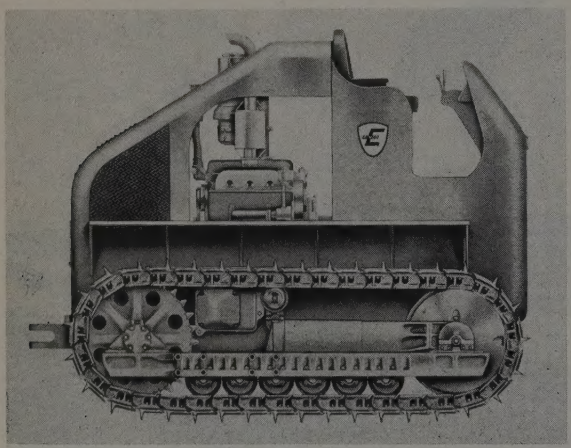
NEW EQUIPMENT

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

Eimco announces a 100-hp. tractor

An expansion in the tractor field is announced by **The Eimco Corp.** with the announcement of its new 103 Series tractors. The tractor was engineered by Eimco from the ground up, to produce a 100-hp. unit.

The 103, a smaller companion tractor to the larger and heavier 105 Series, introduces many new features.



One of these is a modern method of casting heavy steel in large sections, with the castings molded to the established stresses and shapes required. The final drive, center housing and main frame are also produced in one heavy steel casting, without bolts or welds.

The 103 tractor will be 11½ ft. long, 7 ft. 9 in. high and 76 in. wide, with a ground clearance of 17 in. Minimum turning radius of 78 in. indicates excellent maneuverability. The series incorporates the Eimco-introduced up-front operator position, with engine center-mounted behind the operator seat for better balance and traction. Another innovation is the remote mounting of radiator and fan, with separate drive, for maximum cooling capacity.

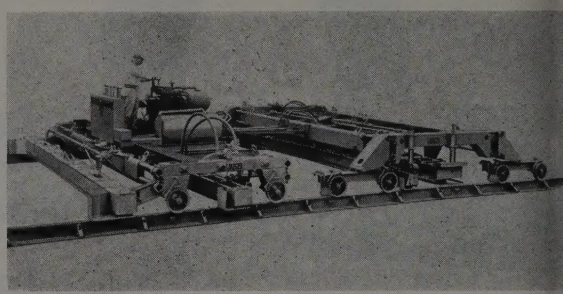
. . . Circle No. 151

Final pavement finishing without operator

The **Jaeger Machine Co.** Model "JF" 20-26-ft. Tranverse Finisher-Float is designed to give a final machine finish to concrete pavements without added labor cost. It is towed by and operated from any finishing machine. No separate operator is needed. It is equipped with both an oscillating screed and a tranverse float. Screed and float pan are suspended between bogie axles, providing a 4-to-1 ratio of correction (a ⅛-in. irregularity in the forms is reduced to 1/32 in. in the pavement). Its total wheelbase of 17½ ft. always spans at least two sections of forms.

The suspended screed has hinged, spring-loaded end shoes, making it independent of adjacent form level. Oscillating ahead of the float pan, the screed eliminates high and low spots, leaving a uniformly smooth surface for floating. The suspended float is also independent of the forms, insuring a final surface that is extremely accurate, usually ready for burlap drag. Smoothness tolerances required on Interstate and state highways, and by the U. S. Engineers on airfield paving, are easily met.

Standard screed has a 6-in. bottom; float pan has a 30-in. bottom. Both are quick-crown change type. Gable-crown screed and pan, also of quick-crown change type, are optional. Screed has 4-in. oscillation with three speeds of 48, 76 and 130 strokes per minute. Screed drive, and the lifting and lowering of



screed and float pan, are all hydraulically operated.

In operation, the unit is towed behind the finishing machine. The screed and float controls, and the power unit are mounted on the deck of the finishing machine and controlled by the finisher operator. Hydraulic hoses with quick couplers connect with screed and pan lift rams and the hydraulic motor which drives the screed.

Thus the unit can be used with any make of finishing machine. It has the further advantage of being easily detachable from the finisher merely by removing a pin and disconnecting the hydraulic couplings. This takes no longer than 2 minutes, allowing the finishing machine to operate independently whenever desired.

. . . Circle No. 15

Plastic pavement marker quickly applied

A permanent reflectorized plastic pavement marking material factory coated with a new pressure sensitive adhesive has been marketed by **Prismo Safety Corp.** The new product is called Plastix "SD." Application is simply a matter of placing it on the pavement and applying light foot or roller pressure. The adhesive coating grips instantly and quickly develops balanced tensile strength. Because its adhesive grips immediately and seals the marker tighter to the pavement with sun warmth and traffic, Plastix SD can be applied with little or no interference to traffic. The material has high chipping resistance, excellent plastic cold-flow characteristics and ability to reseat itself to pavement contour in event of pavement faulting. It is skid-proof in wet and dry weather.

. . . Circle No. 1

THE TAKE-CHARGE D9

—built big and tough for the big, tough jobs

- 320 HP at flywheel.
- 30-ton weight.
- Exclusive Caterpillar oil clutch — plates cooled and lubricated with oil, rarely need adjustment.
- Optional heavy-duty torque converter transmission.
- Heavy-duty steering clutches with finger-tip steering. Power-boosted controls.
- Extra-rugged frame and final drive.
- Massive 7-roller track frame.

These are just the bare facts. No words and pictures can begin to describe the Caterpillar D9 Tractor. Engineered and built to take charge of any job, it's big, tough — and economical in the long run. See what it'll do on *your* job. Have your Caterpillar Dealer put it through its paces. That's all it asks.

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

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

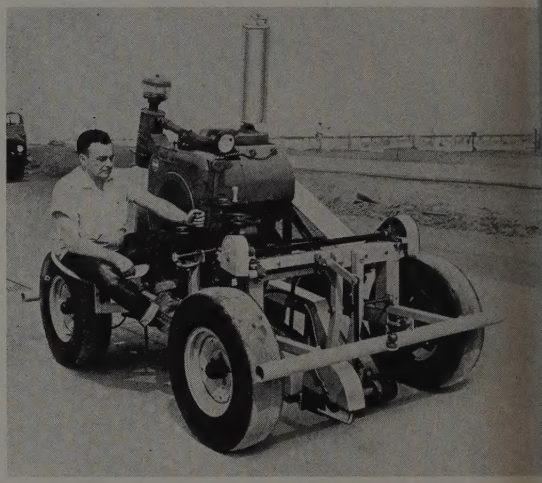
FIND YOUR CATERPILLAR DEALER IN THE YELLOW PAGES

KING OF THE CRAWLERS

Saw for longitudinal paving joints

Clipper Manufacturing Co. announces develo ment of an all-new concrete saw, specially desig and engineered for fast and accurate sawing of lon tudinal control joints. It is powered by a 56.5-h Wisconsin engine. Chassis and all supporting me bers are box welded to assure permanent, accur alignment.

The C-560 is equipped with two independen controlled cutting heads positioned in tandem a



each head is equipped with its own pressure equaliz spring which cushions the blade. It is self propelle and has speeds of zero to 35 ft. per min. with clut control to start and stop.

Adequate water supply to the blades is assur by Clipper's patented system, and direct readi guage measures and indicates the depth of cut all times.

The C-560 is equipped with four smooth-tre compaction roller type tires which have a large co tact area with the slab. . . . *Circle No.*

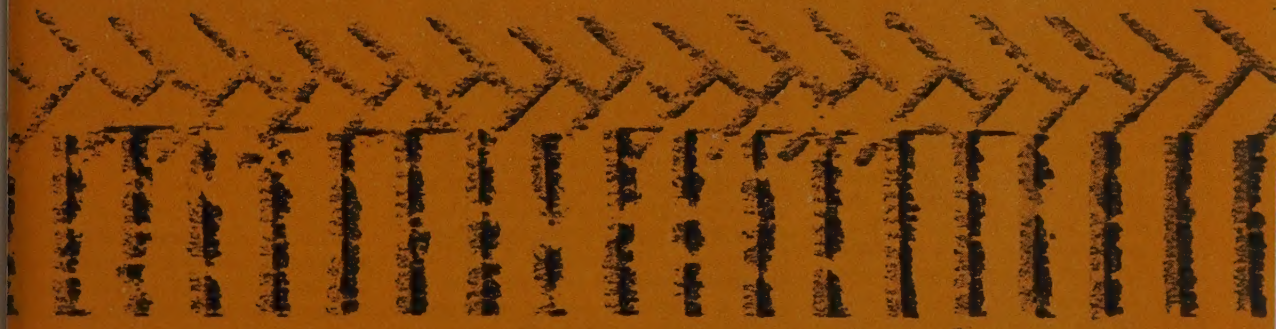
Versatile test drilling unit

Auguring, core drilling and large diameter ear boring can be handled equally well by the new Mo B-40 Explorer introduced by **Mobile Drilling, I** The compact drill is used for continuous flight aug ing to 75 ft., for coring to 500 ft., and for boring ho up to 24 in. in diameter. Drill assembly mounts any ½-ton carrier. It is 37½ in. long, 26½ in. wi and 55 in. high with tower down or 86¼ in. wi tower up. Self powered model includes a 36-hp. a cooled engine. The same drilling assembly also available without engine for mounting on any PT equipped truck, barge or tractor. PTO model weig only 1,400 lb. making the Explorer especially adv tageous in locations which are inaccessible to larg heavier drills. To increase mobility both power a drill frame lower to horizontal position. This featu also permits drilling at any angle from vertical to ho zontal. Drilling speed ranges from 62 to 500 rp Rate of free-feed is 35.3 fpm. Centralized contr permit one-man operation. . . . *Circle No.*

(Turn to page 110 for more new equipment. New Literature can be found on page 104.)

on tires or tracks...

Cummins diesels earn



the most profit!

You can save as much as 50¢ per hour per unit with Cummins Diesels compared to other construction diesels. Coupled with this unequalled economy is the ease of maintenance, dependability and long life that has made Cummins world famous. It's the power that earns the profits!

CUMMINS

There are more than 30 Cummins construction models from which to choose-70 to 600 horsepower. Each is specially designed for heavy construction usage. Leading equipment manufacturers make Cummins Diesels available in more than 400 construction machines of every size and type.

Another reason why Cummins Diesels earn more profit is the excellence of the Cummins Distributor network. More than 350 locations throughout the U.S. and Canada offer genuine Cummins parts – skilled, efficient low cost service. Specify the power that earns more profit-

Standardize on Cummins

. . . for more details, circle No. 12 on Reader Service Postcard

Cummins Engine Company, Inc., Columbus, Indiana

The WEST from WASHINGTON

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

Water resource development and conservation on many fronts are top news from Western construction interests, as Congress heads into the steaming Washington summer with a lot of major decisions yet to be made. A quick rundown reads this way:

1. Passage by the Senate — after five days of debate — of S.44, which authorizes Federal cooperation with the State of California in the huge $1,200,000,000 San Luis unit of the Central Valley Project. The bill authorizes the U. S. to contribute $290,400,000, plus cost of distribution systems and drains (estimated at another $190,000,000 during the debate), to the scheme to move Northern California water into the water-hungry Central Valley. Significant was that Senate opposition, led by Illinois' Douglas, centered around the claim that the project would benefit large landholders. Douglas marshalled figures that indicated that a total of 130 landowners control some 363,000 acres of land to be benefitted by the project.

2. Despite continued low runoff and precipitation in many of the 17 Western states, Bureau of Reclamation reservoirs still have sufficient carryover storage to meet most irrigation needs this season. Said Reclamation Commissioner Floyd Dominy: April runoff into the Colorado River near Grand Canyon was only 36% of the 36-year average. Hydro power production has been reduced, and water supplies are being husbanded for irrigation.

3. The Department of Interior would be required to approve fish-passage facilities before the Federal Trade Commission could license any dam across a river or stream inhabited by anadromous fish (salmon and steelhead), under a new bill (S.1420) introduced by Oregon's Neuberger. The Corps of Engineers already has similar authority over FPC dams that affect navigation.

4. And there were these other developments: BuRec approved a $2,100,000 loan under the Small Projects Act of 1956, for construction of a pipe irrigation system for the Pleasant Valley County Water District in Ventura, Calif.; the Department of Agriculture approved the first loan (to a New Jersey group) to enable a local public improvement organization to participate in a small watershed development project—the $35,000 loan will help finance rebuilding of a 5,100-ft. dike and install three tidegates to keep out tidewater and drain 1,159 ac. of marshland.

* * *

Despite the mounting crisis (as of early June) in funds for carrying on the Federal-aid Interstate highway system work, contracts continued to be awarded at a rapid rate. The Bureau of Public Roads said that $139,000,000 worth of contracts, covering 237 mi. of the Interstate system; plus $11,000,000 worth of engineering work and $28,000,000 for right-of-way acquisition were authorized during April.

And the crisis in funds for the highway network was emphasized in two ways: testimony by Highway Administrator Tallamy that the total Federal cost of the Interstate had mounted by about $13,000,000,000 over the original $26,500,000,000 — if the program is to be completed in the required time; and a BPR report on motor vehicle registrations that showed a total of 68,300,000 vehicles now licensed, a gain of 1,200,000 over a year ago. (California, incidentally, had the highest total registration in 1958, 7,100,000, compared to 4,900,000 in New York. Texas had over 4,000,000, Washington 1,300,000.)

One factor that blocks Congress from taking more vigorous action on replacing dwindling funds in the Interstate trust fund is that a series of major reports are due from BPR in 1961—on costs, very particularly. Administration spokesmen, as well as highway-minded Congressional leaders, have been urging moderation in legislation this year, pending these reports. So, as of mid-June, the odds remain high on some expedient such as borrowing from the Treasury, to tide the trust fund over until 1961; meanwhile, allow the highway program to continue in its present high gear.

* * *

On highways, the excitement about advertising signs along the new Interstate system hasn't gotten much attention these past several months. But there's a bill before the House now (HR 6565) which expresses what is apparently a growing Congressional attitude that roadside advertising isn't such an awful thing.

Said Rep. T. J. Dulski (D. N.Y.) in introducing the bill: "I oppose the zealous theorists who want to stop highway advertising by the gimmick of offering ½ of 1% bonuses to the states (in the 1958 act) to stop highway advertising. In my own state of New York, the outdoor advertising industry spent $1,000,000 for lighting alone, paid property owners $3,500,000; spent $12,300,000 in payrolls. Highway advertising should be regulated, not prohibited."

And Interior's Bureau of Land Management published a set of rules late in May to "govern the erection and maintenance of advertising displays on public lands, with specific reference to such lands that are adjacent to the National System of Interstate and Defense highways. Gist of the rulings: No permits for advertising signs will be issued "except in conformity with . . . national standards to be promulgated by the Secretary of Commerce (and in conformity with) the standards or policies of . . . state or local governments."

* * *

The U. S. Supreme Court has agreed to consider at this session another matter of major importance to the highway program: the question of a state's right to use its funds to reimburse a public utility for the expense of moving its facilities in connection with the Federal-aid highway program.

The case involves the state of Tennessee, which has a state law requiring that the state reimburse utilities for such relocation. There's a further question for the court to decide: If the state should impose all costs of relocation on the utility company, doesn't this amount to confiscation of the company's properties, under the 14th Amendment?

* * *

In a series of three reports, the National Labor Relations Board continued to hammer home its rulings that employer-union agreements giving preference or clearance privileges to unions are illegal.

(Continued on page 23)

WASHINGTON

(Continued from page 18)

In each case, NLRB ordered employers and unions to cease giving effect to union agreements that give unions any measure of control over referral of workmen; their tenure on the job; seniority regulations.

* * *

That $480,600,000 appropriation bill for the National Aeronautics and Space Agency (NASA) includes $53,000,000 for construction of various facilities — and of that total, something over $14,000,000 will be spent in the West.

Western facilities included in the appropriations are: $6,600,000 for construction of a data reduction center and other facilities at the Ames Research Center, Moffett Field; $2,800,000 for additions to buildings and other construction at the high speed flight station, Edward AFB; $3,000,000 for launching facilities, check-out facilities and special experiments at the Pacific Missile Range at Pt. Arguello, Calif.; $15,300,000 for global range tracking stations and equipment, at various locations.

* * *

Shorts: The Concrete and Aggregate Producers section of the Associated General Contractors-AAP Joint Cooperative Committee grew to three, with addition of the National Crushed Stone Association . . . After a 2-year- slackening in the rate of growth, U. S. mortgage debt on non-farm homes moved up fast in 1958, to reach $118,000,000,000, a jump of 9.7% over 1957 . . . Senator Kefauver's bill (S.1571) to create a "Department of Consumers" that would include such agencies as the Bureau of Labor Statistics, has popular appeal, but isn't rated much chance in the current session of Congress . . . Bureau of Reclamation has stopped filling (in early June) Canyon Ferry reservoir in Montana, to permit wild geese nesting along the grass-grown reservoir's sides, to finish raising their families . . . Life of the Alaska International Rail and Highway Commission is extended to June 1, 1961, in order to continue studies and make recommendations on construction of rail and highway facilities. Senate okayed the measure, passed it on for House consideration.

Seaman-Andwall Trav-L-Plant

ON

L & M Construction Co. projects lays daily average of 1½ miles of Soil-Cement

Wet mixing and water admixture are performed simultaneously with the Seaman-Andwall TRAV-L-PLANT.

Old asphalt cake is ripped up for pulverization and re-processing by the Seaman-Andwall TRAV-L-PLANT.

Cement is spread with Seaman-Andwall mechanical Spreader.

Rolling by Seaman-Andwall 5620 pneumatic compactor closely follows the final mixing pass of the TRAV-L-PLANT.

"... AND 2 MILES A DAY WHEN THE CEMENT SUPPLY KEPT PACE"

The job was in Arizona — re-constructing an access road to carry heavy truck traffic to Glen Canyon Dam.

1. The old 22 foot asphalt penetration surface with 6 inches of the base was scarified with motor graders and bladed into a windrow. The Seaman-Andwall TRAV-L-PLANT then reduced the lumps to original aggregate size.

2. The material was then bladed flat and cement was spread by a mechanical spreader to a width of 24 ft.

3. Again the TRAV-L-PLANT came into use following close to the Spreader. Two mixing passes were enough to get the cement uniformly mixed.

4. Water was then applied through the pumping system of the TRAV-L-PLANT in a single pass at the rate of 250 GPM with the TRAV-L-PLANT cutting-in and mixing the moisture at the same time.

5. In final mixing no water was added. One pass brought the mix to optimum (12%).

6. To get compaction fast, L and M Co., used two Seaman-Andwall 5620 seven to twenty ton pneumatic Self-Propelled Compactors, closely following the final mixing pass.

7. Surface was sealed by an application of asphalt emulsion.

Romeo Dauphanais, general superintendent for L & M Construction Co. says, "We saved a lot of money by buying this Seaman-Andwall Equipment ... and we got a job to be proud of. A B52 could land on this pavement and never crack it."

SEAMAN-ANDWALL
a subsidiary of
A-M

SEAMAN-ANDWALL CORPORATION
ELM GROVE 17, WISCONSIN

... for more details, circle No. 15 on Reader Service Postc

WESTERN CONSTRUCTION

Those weasel words, ". . . or equal"

A HANGOVER from the time when all construction was viewed with suspect and possible collusion between engineer and contractor needed legal barriers, the term ". . . or equal" no longer serves its intended purpose. It often does more harm than good. The words are a mild legal insult to the engineering profession and make for discord in the engineer-contractor relationship.

A properly qualified engineer, or engineering organization should be able to select the best product, material or service for any intended purpose. Such selection should be so stated in the specifications. The political and legal implication that such positive designation just might have a faint odor of favoritism is a disparaging attitude toward public works engineers and private consultants. Their function is to develop adequate design and then designate the best products to be incorporated in such design. Aside from the alleged legal protection of the public, the only other excuse for ". . . or equal" is an engineering admission that knowledge of requirements and available products is inadequate. There may also be a reluctance to take a firm stand and back a specified selection. From the point of view of the designer and specifying agency the basis for bidding will be strengthened with the designation of a particular product by its name and company identity, without the weasel words.

Approached from the other side, such a positive selection places the bidders on the same footing and eliminates any attempt to bid the ". . . or equal" with hopes of selling this product to the engineer. Bids do not reveal such planning on the part of a contractor. But award of contract soon develops differences of opinion on the acceptance of a substitute, with all the related friction. They serve small purpose and can result in a loss to the ultimate owner. Loss on the installation of a possibly inferior product must be combined with the loss in time and the irritation, always a negative factor in reaching agreement during a construction job.

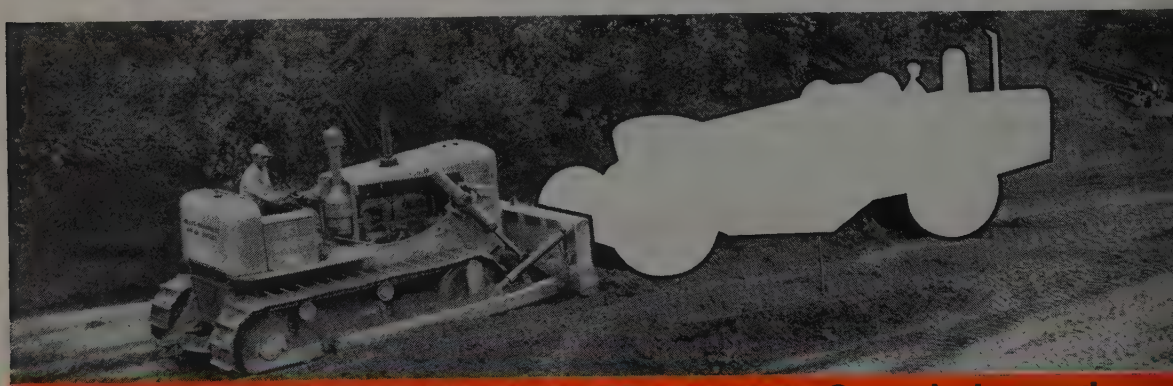
Exceptions can be made to this proposal for modernizing construction specifications. Industry moves fast and new products of improved character follow each other at a rapid pace. Conceivably the engineer may not be familiar with the latest and best product development, but the responsibility is that of the manufacturer and not the contractor. Another situation relates more to procedure than product. A contractor may have equipment available or present ideas that will make logical a revision in the construction plans and methods suggested by the engineer.

In the general style of engineering specifications where the ". . . or equal" term runs through the product designations, its elimination could well remove a shadow of discord from any project. Construction will be simplified, even with wails from the legal profession, if the phrase is allowed to take its place with other construction phrases of history.

Jim Ballard

DAY IN...DAY OUT, THIS ALLIS-CHALMERS 9½-YARD TS-160 OUTWORKS ITS LEADING COMPETITOR...AND DELIGHTS ITS OWNER*

This is no demonstration setup. It's a road job* where these two self-propelled scrapers worked every day . . . push-loaded by the same Allis-Chalmers HD-16 torque converter tractor. That made every loading cycle about as identical as they'll ever get. And hour after hour, the TS-160 moves out of the cut with a heaped load in an average of 42% less time than its 9-yard companion of another make. *This is extra work power you can turn into more production!*



Scraper X, heaped loads in 35 seconds, 9 yards heaped

TS-160, heaped loads in 30 seconds, 9½ yards heaped

* *Further details on request*

You may be surprised . . . may even challenge these facts. But facts they are, and we invite you to check them on *your* job, with *your* stop watch. Your Allis-Chalmers dealer will provide the TS-160.

...move ahead with ALLIS-CHALMERS ...power for a growing wor

ALASKA
Yukon Equipment, Inc.—Seattle and Anchorage

ARIZONA
Neil B. McGinnis Equipment Company—Phoenix

NORTHERN CALIFORNIA
Industrial Tractor Sales—North Sacramento
Shasta Truck & Equipment Sales—Redding
West Coast Engine & Equipment Company
Berkeley Branch: San Jose and Ukiah
Trinity Tractor Company—Eureka

SOUTHERN CALIFORNIA
Construction Machinery Co.—San Diego
San Joaquin Tractor Co.—Bakersfield
Shaw Sales & Service Co.—Los Angeles

IDAHO
Southern Idaho Equipment Co.—Idaho Falls and Twin Falls
Southern Idaho Equipment Co. of Boise, Inc.—Boise

MONTANA
Mountain Tractor Company—Missoula and Kalispell
Seitz Machinery Company, Inc.—Billings

NEVADA
A D Machinery Company, Inc.—Elko and Las Vegas
Reno Equipment Sales Co.—Reno

OREGON
Haupert Tractor Company—Medford
Wood Tractor Company—Portland
Timber Tractor Company—Springfield

UTAH
Cate Equipment Company—Salt Lake City

WASHINGTON
Pacific Hoist & Derrick Company—Seattle & Puya
American Machine Company—Spokane

WYOMING
Studer Tractor & Equipment Company—Casper

. . . *for more details, circle No. 16 on Reader Service Poste*

KING PUBLICATIONS

WESTERN CONSTRUCTION

JULY 1959

PIPEMOBILE, carrying a 63-ton pipe section, moves down ramp to bottom of trench. Nose tire and double front tires are raised and lowered independently to permit machine to enter and withdraw from pipe sections. Front and rear operators keep in touch by intercom.

Pipemobile hits the home stretch

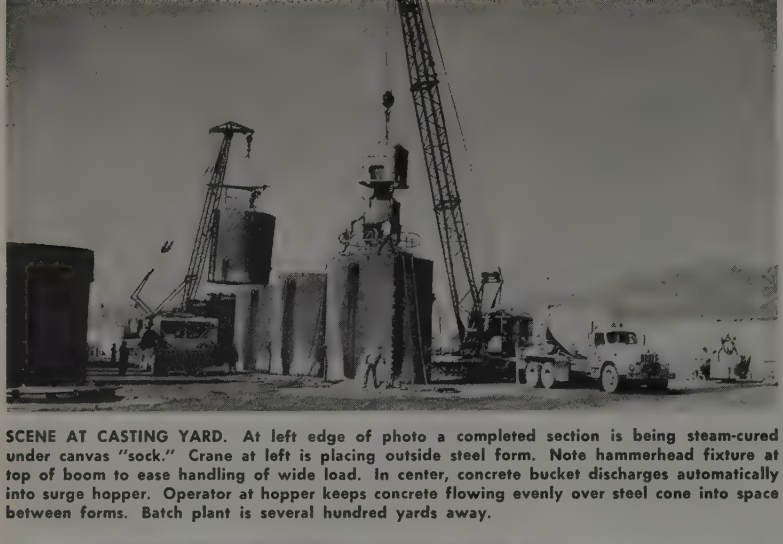
Unique pipe-laying machine, nearing end of two years of work, makes a tough job look easy. Here's a final look at how huge pipe sections are cast, transported, and placed to double the capacity of the Colorado River Aqueduct.

THE FABULOUS PIPEMOBILE, ponderous but precise, is nearing the end of its long trip across Southern California. For the past 2 years the 65-ton machine has been placing gigantic concrete pipe sections which will double the capacity of the Colorado River Aqueduct. During that time the Pipemobile has performed for literally hundreds of fascinated construction men from all over the country, for it's the biggest change in pipe-laying methods to come along in a decade.

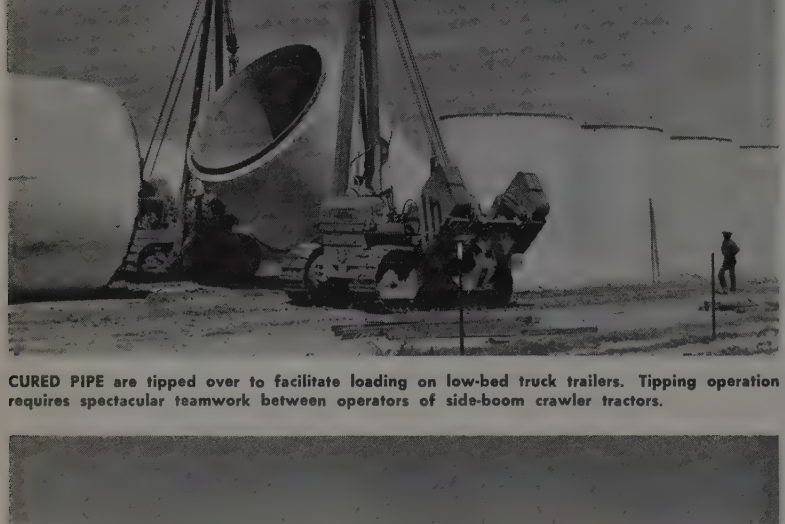
The Pipemobile was designed and built by the contractor, American Pipe & Construction Co., winner of all of the Metropolitan Water District's contracts for double-barreling the Colorado River Aqueduct siphons. When this celebrated 240-mi. waterway was built 20 years ago the tunnels and grade conduits were built full size in anticipation of future growth, while the siphons were built to a size expected to be sufficient until 1980. The fantastic population increases in Southern California have sliced 20 years off that estimate, and the 22 mi. of siphons are being double-barreled now. The siphon pipe-laying operations will be completed late this year, after which the District will be able to transport its full contract allotment of 1,212,000 ac.-ft. per year from the Colorado River.

In 1957 American Pipe began work on two contracts for the Metropolitan Water District totaling about $16,000,000. The contracts involved placing about 12 mi. of siphons spaced along 183 mi. of the aqueduct route. When this work was nearing completion in the middle of 1958 American was low bidder on the final contract at $6,500,000 for about 7.5 mi. of siphon on the 30-mi. stretch leading to Lake Mathews.

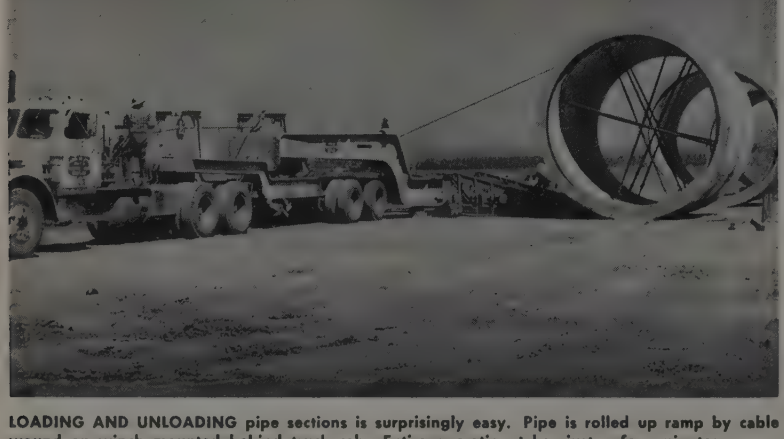
The Pipemobile has been the star of the show on all 3 contracts. It picks up a pipe, carries it into the trench, sticks its nose in the previously placed pipe and positions the new pipe section with great accuracy. When the pipe is backfilled sufficiently to hold it in place, the Pipemobile backs out and returns to pick up another sec-



SCENE AT CASTING YARD. At left edge of photo a completed section is being steam-cured under canvas "sock." Crane at left is placing outside steel form. Note hammerhead fixture at top of boom to ease handling of wide load. In center, concrete bucket discharges automatically into surge hopper. Operator at hopper keeps concrete flowing evenly over steel cone into space between forms. Batch plant is several hundred yards away.



CURED PIPE are tipped over to facilitate loading on low-bed truck trailers. Tipping operation requires spectacular teamwork between operators of side-boom crawler tractors.



LOADING AND UNLOADING pipe sections is surprisingly easy. Pipe is rolled up ramp by cable wound on winch mounted behind truck cab. Entire operation takes just a few minutes.

tion. The only assistance it ever needs is a boost from a crawler tractor or two when grades become excessive.

The pipe being placed is of two sizes, 13 ft. in diameter, weighing 63 tons, and 13½ ft. in diameter, weighing 68 tons, depending on the hydraulic gradient. The pipe sections are manufactured in a field casting yard which has been located in three different places.

Pipe manufacture

All of the pipe requires two cages of steel reinforcement, one circular and the other elliptical, providing for both internal and external loads. American Pipe fabricates the reinforcing cages at its Etiwanda plant which is 200 mi. from some parts of the pipe-laying project. For some reaches where higher internal pressures are involved a steel cylinder is used in addition to the two reinforcement cages.

Longitudinal rods are placed in position on a company-designed and built cage winding machine. A continuous steel rod is fed from large spools directly on to a revolving drum. When the steel has been wound spirally around the full length of the cage assembly, longitudinal and circular rods are joined by an automatic welder which, as it moves into each position, releases a surge of power at the point of contact and welds the rods together. The finished steel assemblies are taken by truck to the casting plant. About 60 of the reinforcing cages arrive each week.

The main features of the casting yard are several office buildings, a Conveyco batch plant, aggregate stock-piles, cement silo, steam boiler, storage area for finished pipe sections, and 28 steel base plates on which the pipe are cast. Steel forms are used, the inside and outside form each a complete unit, moved at one time. The outside form has 6 fittings for vibrators. The casting yard is in the San Jacinto Valley near Lakeview, its third and last location. The first two times it was moved it took about three weeks to tear down, move, and set up again. Its present location is about 200 mi. from its previous, near Freda, Calif.

A typical cubic yard of concrete is composed of the following: 1,200 lb. of sand, 969 lb. of 1-in. aggregate, 1,030 lb. of 1½-in. aggregate, 26.8 gal. of water, and 625 lb. of cement (6.65 sacks). If the concrete in the bucket is over 85 deg. F. Sika Plastiment is used as an ad

mixture. Daytime temperatures in the desert often reach 120 deg.

When the inside form, reinforcing cage, and outside form are fastened securely into place, a crown ring is set in place which keeps the forms in alignment as concentric cylinders. A conical pouring top facilitates movement of the concrete into the annular space between the forms.

The concrete is crane-placed by bucket. Concrete is brought from the nearby batch plant by transit truck.

The 2½-yd. bucket handled by the crane releases the concrete into a 3-yd. surge bucket atop the pouring cone. An operator with pneumatic controls keeps the concrete flowing smoothly from the hopper over the cone into the forms.

The six vibrators located on the outside form are put into operation with the first bucket of concrete and are kept going until 10 min. after the last bucket—a total of about 45 min. The 13-ft. diameter 13-in. wall thickness pipe sections require about 27½ cu. yd. of concrete.

It takes about 7 hr. to pour 13 pipe sections. Setting the forms starts about 6 a.m. and concrete pouring starts at 9:00, when 3 or 4 forms are set up and ready for the next pour.

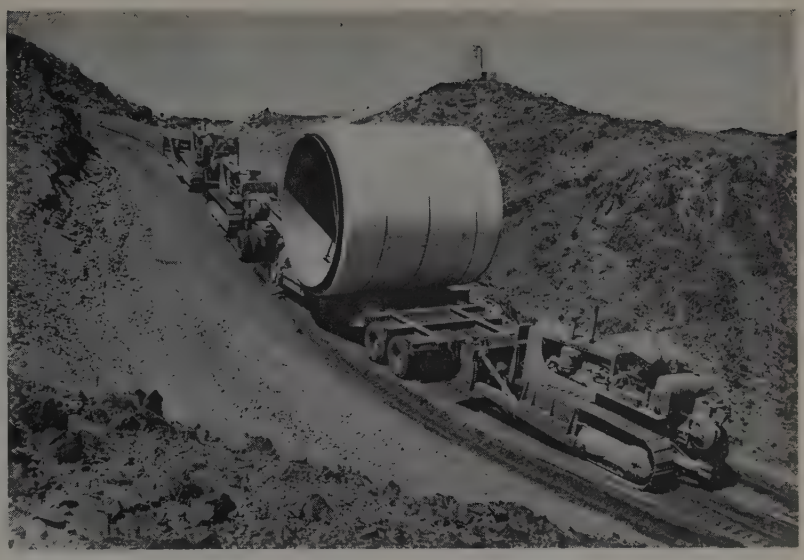
Labor required consists of the crane operator and oiler, the pouring operator at the surge hopper, the vibrator man and 4 finishers who work on the top of the pipe after the last concrete is placed.

When vibration is complete the pipes are steam cured in the forms until the next morning at which time the forms are removed and a canvas cover, called a sock, is placed over the pipe for an additional 24 hr. A stationary steam boiler is used because the contractor was unable to find a portable one large enough. The final steps are 7 days of water spraying and an outside coat of Edoco curing compound.

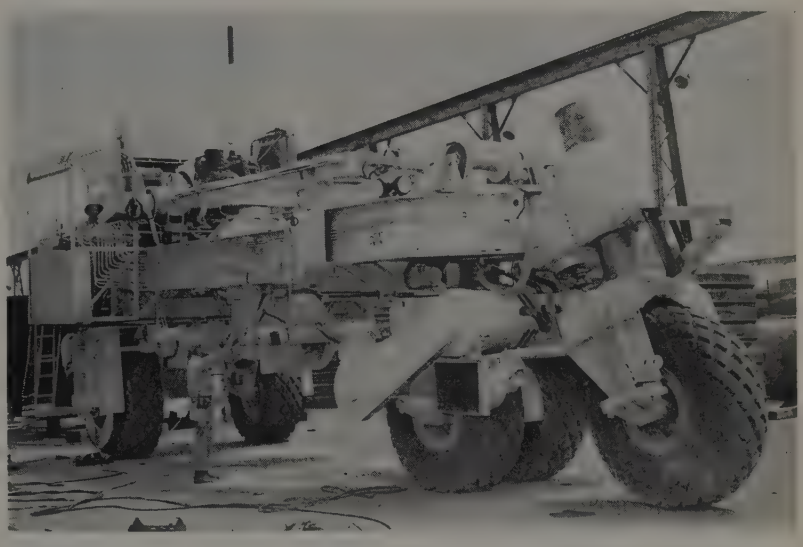
Transporting pipe sections

The pipe sections are carried from the casting yard to the storage area by two heavy-duty side boom crawler tractors.

An impressive display of coordination is shown by the operators of the two tractors as they "walk" a pipe section to the storage area and tip it over on its side. The synchronization is truly spectacular during the tipping operation as the



STEEP ROAD requires three crawler tractors to move heavy load. Pipe has been turned 90 deg. from normal traveling position to simplify unloading at confined site.



PIPEMOBILE stops for check-up at maintenance yard. Two more tires were added later on rear to improve stability. This was only major change made from first design. Rig weighs 80 tons.

PIPEMOBILE gently enters previously placed pipe. Operator shown controls only steering. Rear operator controls speed and pipe positioning rams. Record rate of placement is 20 in 8-hr. day.

bulky 65-ton pipe is flipped gracefully into place just a foot or two from the previous section. The movements of the tractors are quick and sure and it appears as if both machines are controlled by one operator.

Getting the pipe sections from the casting yard to the point of placement is a major phase of the operation, especially in remote areas where there are no roads. Well over 200 mi. of temporary roads have been built by the contractor to date to ease this phase of the work. At present the casting yard is in the San Jacinto Valley and the pipe sections are being placed about 15 mi. away. The pipes are transported on special Utility low bed combination truck and trailers about 99 ft. long with the load distributed over 42 tires. Loading, travel, unloading and returning to the plant takes about 2 hr. Utility equipment is also used for bringing the steel reinforcing cages from the Etiwanda fabricating plant to the casting yard. Three of the cages weighing between 8,500 and 10,000 lb. are carried on each unit.

A simple method is used for loading and unloading the big pipe sections on the low-bed trailer. In the yard a Pitman crane places a ramp next to the trailer and the pipe is rolled easily into place by a winch and cable arrangement carried on the trailer. The entire operation takes only 8 to 10 min. Specifications call for nine struts.

Placing the pipe

The trench is dug by a Lima and a Bucyrus-Erie dragline, usually working on the swing and graveyard shifts. The siphons being placed usually parallel closely the original aqueduct which means that no additional overburden can be placed on that side of the trench and equipment must operate on the other side to avoid the necessity of bridging over the old line. Placing the pipe sections with a large crane would have been particularly difficult in this case because the crane would have to work from the side where the dirt is piled. This is one reason the Pipemobile was developed.

The joint for the big pipe section is a bell and spigot type using steel joint rings and 15/16-in. rubber gasket. The spigot ring is a Carnegie shape M3836 with a 3-in. skirt. An inorganic soap is spread over the gaskets and the bell to serve as a lubricant during seating. Water District inspectors know that the joint is proper by a visual inspection of the spaces between the pipe ends. The correct space inside is 1½ in. and outside 2½ in. Three small spacers are placed near the bottom of the in-place pipe as the new pipe is inserted. The spacers are in two parts for easy removal. A feeler gage is used to check contact between the rubber gasket and the steel bell ring.

The joint is grouted outside with a grout consisting of one part cement to three of sand. After trying several methods of containing the grout in the joint American Pipe settled upon Thilmany type E2 dry wrap paper secured with three bands of steel strap. The paper bulges enough under the pressure of the grout to enable inspectors to make sure the grout has flowed all the way round. The inside joint recess is filled with a stiff mortar, hand-placed and pointed flush with adjacent pipe surfaces.

The Pipemobile is 39 ft. 4 in. long and 13 ft. wide, enabling it to pass through a 13-ft. inside diameter pipe. There are six 44-ply, 2100-25 tires. There are two widely spaced pairs at the rear for stability, a closely spaced pair at the front and a nose tire leading the way. Primary power source for the machine is a 225-hp. diesel engine which drives a 250-kva. DC generator. The generator was originally used in a submarine. Each of the four drive wheels receives power through a chain drive from a 50-hp. electric motor. Maximum speed is a little over 2 mph.

Two operators are required, one at the right rear and one at the front. The front man operates only the front wheel steering. The two operators are connected by an intercom system.

Here's how the Pipemobile works. It approaches a pipe running on its rear wheels and double front wheels with its nose wheel raised. When the nose wheel enters the pipe it is lowered, while the front wheels are retracted, thus transferring all the forward weight to the nose wheel. The machine is driven into the pipe until the nose wheel emerges at the other end, the weight now being carried by the double front wheels inside the pipe. The nose wheel is lowered to the ground, the machine is moved forward, and the double wheels are lowered to the ground. Four hydraulically operated beams which run the length of the pipe are extended, exerting pressure against the inside of the pipe wall until the pipe is lifted off the ground. The Pipemobile is now able to carry the pipe into the trench. When the nose wheel has entered the previously placed section it is lowered while the double wheels are retracted, shifting the weight to the nose wheel running on the inside of the previously laid pipe. The machine inches forward until the spigot end of the pipe it is carrying is within a few inches of the bell end of the stationary pipe. The vertical and horizontal rams are manipulated to tip the pipe up or down at either end, angle it from one side to the other, or raise and lower it until it is exactly in position for insertion. When the signal is given it is moved slowly forward until the new pipe section is firmly locked into its permanent position.

When laborers have shoveled material quickly into place under the new pipe section to hold it, the Pipemobile withdraws and returns to the storage yard. Where the pipe is laid on downhill slopes exceeding about 10%, special anchorage is provided for each pipe section by means of buried concrete anchor blocks placed in advance at the joint positions, each anchor having an embedded steel plate to which an angle clip is bolted to hold the pipe section against sliding.

Under favorable conditions, the machine lays an average of 20 sections in an 8-hr. shift.

Personnel

For the Metropolitan Water District of Southern California, Robert B. Diemer is general manager and chief engineer, Robert A. Skinner is assistant chief engineer, and H. J. Mills is construction engineer. William F. McCleary is aqueduct superintendent and Tom Cain is resident engineer. Field engineers are Al Hovanec and George Fox, Jr.

For the American Pipe & Construction Company, E. F. Butler is project manager, C. E. Grant is field superintendent, E. H. Curtis is project engineer and L. S. Leister is office manager. H. M. Hoffman is plant superintendent, J. W. Johnson is fabricating plant superintendent, M. H. Angel is master mechanic and O. R. Johnson is assistant field superintendent.

EARTHMOVING equipment advances first stage of Willard Dam across a shallow arm of Great Salt Lake. Dam will create a fresh-water reservoir.

Storing fresh water in Salt Lake

By W. E. COLLINS
Assistant Head, Earth Dams Section
and
D. L. GOODMAN
Engineer

Bureau of Reclamation
Denver, Colorado

Diking off a 10,000-ac. area of Great Salt Lake to create a fresh water reservoir is a challenging project in earthfill construction. Foundation and settlement problems require a three-stage program. Stage 2, now under contract, will require 10,000,000 yd. of fill.

THE Bureau of Reclamation awarded a contract on June 5 for construction advancing the placement of the embankment for Willard Dam, a major feature of the Bureau's Weber Basin Project in north-central Utah, and one of the most challenging earthfill dam jobs ever to be undertaken by the Bureau. The $4,606,206 contract was awarded to George M. Brewster & Son, Inc. of Bogota, N. J., lowest of twelve bidders. Work under this "second stage" of the dam's construction will include the excavation and placement of 10,000,000 cu. yd. of earth material and the excavation of 50,000 cu. yd. of drains. The contractor has about three years to complete the work.

Stage construction

Willard Dam is being constructed in three stages, because of the unusual and difficult foundation conditions encountered which necessitate intervening periods of placement to allow sufficient time for foundation settlement. Completion of the U-shaped dam to its full height of 34 ft. will take about 5 years. When it is eventually topped out under Stage 3, it will be 14.5 mi. long, the Bureau's longest earthfill dam, and it will require the excavation of about 16,000,000 cu. yd. in borrow areas for placement in the embankment.

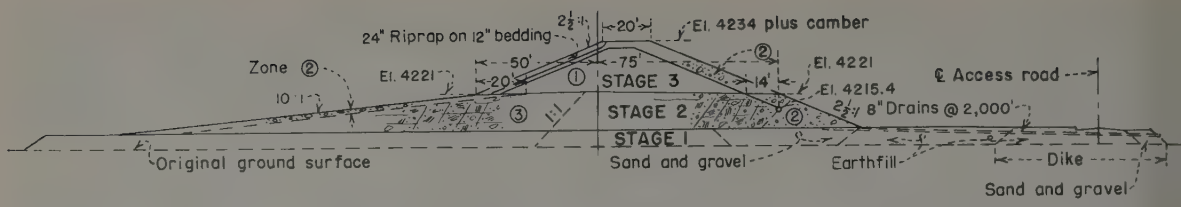
Work under Stage 1 of construction is near completion. M. H. Hasler Construction Co. and H. C. Smith Construction Co. of Los Angeles hold a joint contract of $1,-101,140 for the initial dam embankment placement and drainage construction in the borrow area. The contract was about 75% completed at winter shutdown in late November last year. With resumption of work this spring, the contract is scheduled for this month.

Willard Dam is to serve as a dike enclosing about 10,000 ac. at the extreme east end of Willard Bay, an arm of Great Salt Lake, about 11 mi. northwest of Ogden. The area thus diked off will retain 215,-000 ac. ft. This fresh water will be diverted from the Weber River, one of the three main rivers which feed into Great Salt Lake. Water to serve project needs will be pumped from the reservoir and conveyed south via a canal.

Design of Willard Dam

The design of Willard Dam and the construction plan adopted are the results of several years of investigations of the site geology and analyses of the foundation problems. Willard Bay is a large mud flat covered by a shallow depth of fresh water during fall and winter months. Except for the somewhat deeper center section, it may dry up during the dry season.

For centuries, the rivers entering Great Salt Lake have deposited sediments, until now there are hundreds of feet of sand, silt, and clay forming the bottom of the lake. In the bay area there are thick deposits of organic silt, inorganic silts and clays, and peat, containing zones of marsh gas, overlying a sand stratum. These soft materials



EMBANKMENT cross-section shows the three-stage construction of Willard Dam, necessitated by deep, soft silt underlying area. Stage 1 composed of clay, silt and sand compacted in 6-in. layers; Stage 2 made up of sand, gravel and cobbles, and Stage 3 compacted silt, sand and clay

must necessarily support the dam.

Additional major construction problems are caused by numerous artesian wells in the reservoir area most of which have been plugged but which remain a source of potential artesian flow in the borrow area. The soft silty materials also are a continuing challenge to the contractors who must keep heavy earth-moving equipment in operation during construction of the dam.

Surface and subsurface geological investigations at the dam site in 1950 and 1951 led to the conclusion that the relatively weak silts and soft clays would be sufficiently competent to support a broad-based low dam. The investigations also indicated that impervious material for the structure could be obtained from the immediate vicinity of the dam. In 1955, a test embankment was constructed within the reservoir area to supplement the earlier geological investigations and to observe field measurements on the foundation settlement and obtain data on pore pressures in the foundation.

Test embankment

Construction of the test embankment was begun in June 1955 under a $43,500 contract awarded to Young & Smith Construction Co., Salt Lake City. Construction was initially slowed down because large capacity earth-moving equipment mired in the wet subsoil in the borrow areas. After smaller hauling equipment was obtained and haul roads were constructed, embankment placement proceeded slowly until the end of July; thereafter, placement continued rapidly until completion in September.

The 179,283-cu.-yd. test embankment is 35 ft. high, 30 ft. wide, and 240 ft. long at the crest, and 570 ft. wide and 796 ft. long at the base. During the 60-day construction period, the foundation beneath the embankment settled 1½ ft. Measurements taken regularly since 1955 indicate that the foundation has so far settled a total of 6½ ft. However, the rate of settlement is decreasing.

From data obtained from the test embankment, a 7.1-mi.-long dike was designed and constructed in 1957 to unwater the foundation and reservoir area. Two drains, designated as the east and south drains, a 2,500-ft.-long levee, and a 10,000-ft. access road were also constructed. The drains, built on the east and south sides of the reservoir area, intercept surface runoff from the area to the east and south of the reservoir and discharge it into the bay to the west.

During the fall and winter months, flows from the Bear River (largest of the rivers feeding into Great Salt Lake) are discharged through the Bear River Migratory Bird Refuge into Willard Bay, immediately north of the Willard Reservoir site. These flows cause the water surface in the bay to rise, but not generally higher than elev. 4,204. The dike thus also serves to exclude the Bear River water from the reservoir and dam foundation area.

The dike was constructed to elev. 4,206 and to a maximum height of about 6 ft. The crest had a minimum width of 45 ft. which allowed ample room for turn-around of the hauling equipment. The major portion of the dike was constructed of clay, silt, and sand compacted by hauling equipment. The thickness of the initial lifts was sufficient to support the hauling equipment, and in some reaches it was as much as 4 ft. For 5.7 mi. of the dike the downstream slope was subject to wave action from Willard Bay and was accordingly protected by a zone of sand and gravel having a 10-ft horizontal thickness.

Fill for the dike embankment was obtained from two sources designated as borrow areas A and B. Borrow area B, covering about 165 ac., is in the reservoir area. The 235-ac. borrow area A is immediately northeast of the reservoir site and is also one source of material for the dam embankment.

The 16,500-ft. east drain is a broad V-shaped ditch having a 1:1 side slope on the west side and a 5:1 side slope on the east side. The south drain, 43,000 ft. long, is a flat-bottomed ditch having 2:1 side slopes. The bottom width of the first 27,200 ft. of the ditch (at the

Unit bids for Stage 2 of Willard Dam

(1) Geo. M. Brewster & Son, Inc.	$4,605,260
(2) Morrison-Knudsen Co., Inc.	4,677,716
M. H. Hasler Const. Co.—H. C. Smith Const. Co.	4,886,374
Darkenwald Const. Co., Inc.	4,932,768
Hyde Construction Co., Inc.	5,406,113

		(1)	(2)
Excavation in South Drain, Zones 1 & 3	50,000 cu. yd.	$ 1.25	$ 1.60
Excavation, dam embankment foundation	40,000 cu. yd.	.50	.60
Borrow area excavation, Zones 1, 2, 3	5,000,000 cu. yd.	0.485	0.46
Borrow area excavation, Zones 1, 2, 3	5,000,000 cu. yd.	0.405	0.44
Compacting embankment, Zone 1	21,000 cu. yd.	.50	0.22
Furnish sewer pipe; construct toe-drains	4,000 lin. ft.	3.00	4.80
Construct 5 piezometer terminal houses	Lump sum	20,000.00	16,800.00
Installation of piezometers	109 piezometers	100.00	120.00
Install foundation settlement devices	20 devices	200.00	480.00
Furnish, set surface settlement points	1,024 points	15.00	9.00

Opened May 14 in Ogden, twelve bids were submitted. Totals for the five low are given above. The other seven ranged up to a high of $8,914,280. The average was about $6,162,000. The engineer's estimate was $5,361,115.

west side of the reservoir) is 20 ft.; the next 12,800 ft., is 14 ft. wide; and the last 3,000 ft. is 10 ft. wide.

Building in stages

Construction of the dike, levee, and access road was begun in July 1957 by the Jack B. Parsons Construction Co., Smithfield, Utah, and completed in December of the same year under a $349,400 contract. The drains were built by the Vega Engineering & Grading Co., Berkeley, Calif., during the period July-October 1957; contract amount was $76,394.

In March 1958, a $6,919 contract was awarded to the L. T. Johnson Construction Co. of Ogden for construction of a series of open drainage ditches, totaling 9,100 ft., in borrow area A. This work, completed in June 1958, was carried out to lower the water-table in the borrow area, thereby increasing its potential as a source of embankment material for the dam. The ditches have bottom widths of 4 ft. and side slopes of 1½:1.

Start on Stage 1

With these essential preliminary steps completed, the contract for Stage 1 of the construction of the dam was awarded in June 1958. The section of the dam being constructed under this contract is adjacent to and parallels the dike on the north side of the reservoir. It is 4.3 mi. long, 6 ft. high, and requires the excavation of 2,200,000 cu. yd. in borrow areas. The embankment incorporates the dike on its "downstream" or Willard Bay side (see cross-section).

Because of the soft foundation, Willard Dam has a maximum base width of 455 ft. The dam embankment being constructed under Stage 1 as well as that planned for placement under Stages 2 and 3 has three zones, each zone being of a different material and having a different method of placement.

Zone 1 is designed as the water barrier for the dam and consists of clay, silt, and sand. The material in this zone is selected from the most desirable portions of the borrow area and is placed in 6-in. layers and compacted to 95% of standard Proctor density. Zone 2 immediately downstream from zone 1 consists of sand, gravel, and cobbles and forms a collection filter for water seeping through the embankment. Zone 2 material also protects the downstream slope of the embankment against erosion.

The upstream and downstream zone 3 provides weight for stabilizing the foundation of the dam. The upstream zone 3 is constructed partially on a 10 to 1 slope and is covered with a layer of sand and gravel which protects the slope against wave action in the reservoir. The portions of the upstream zone 3 above elev. 4,221 will be constructed on a 2½ to 1 slope and will be protected by riprap. The material used in zone 3 consists of clay, silt, and sand or mixtures of these materials and is being placed in 6-in. layers and compacted by the contractor's hauling equipment.

The contract for Stage 1 construction also calls for excavation of 4,524 ft. of drainage ditches outside the limits of the borrow area, and 2,126 ft. of drainage ditches within the borrow area, and included as part of the excavation.

The contractor for Stage 1 construction maintained good progress during the 1958 construction season. Drainage excavation completed by early fall was effective in lowering the water-table throughout the borrow area. The contractor used at first a large plow in the borrow area to scarify the material and thus increase evaporation of excess water. During the hot months of July and August, the plowing was not necessary, but it was resumed in September.

During the month of September, eleven 25-cu.-yd. capacity scrapers were used to remove material in the borrow area, and two crawler tractors were used as pushers. Working two 10-hr. shifts, 6 days a week, the contractor excavated 350,000 cu. yd. of zone 1 and zone 2 material during the month. By November 24, when earthwork was discontinued, a total of 1,800,000 cu. yd. had been excavated and placed in the embankment.

Stage 2 will add 15 ft.

The 13.6-mi. embankment to be placed under the new contract for Stage 2 construction will raise the embankment placed under Stage 1 construction 15 ft. and will bring the dam to a maximum height of 21 ft. above foundation.

Throughout Stage 1 construction, measurements of foundation settlement and embankment consolidation have been closely observed and recorded. These measurements will be continued during Stage 2 construction which will include five separate piezometer installations to measure pore pressures in the foundation as the embankment is placed. In addition, 20 base plate installations will measure the amount of foundation settlement under the embankment load. More than 1,000 surface settlement points will be installed at the upstream and downstream toes of the embankment. From these points any movement of the toes, either laterally or vertically, can be detected and the rate of construction controlled.

Final Stage 3

Construction proposed under Stage 3 will add an additional 3,400,000 cu. yd. to the dam and will bring it to its full 34-ft. height, plus an additional allowance for settlement. Necessary modifications in design, based on data recorded during Stage 1 and 2 construction, will be made prior to start of Stage 3 embankment placement. The dam's outlet works in the northeast corner of the reservoir will also be built under stage 3.

Personnel

Design and construction of Willard Dam and other features of the Weber Basin Project are under the direction of Grant Bloodgood, Assistant Commissioner and Chief Engineer of the Bureau of Reclamation, at Denver. C. D. Woods, at Ogden, Utah, is Projects Manager. The Weber Basin Project is in the Bureau's Region 4. E. O. Larson is Regional Director at Salt Lake City.

Salt Lake to build big parking facility

AN 8-LEVEL parking facility will be erected in Salt Lake City, adjoining Walker Bank Building, as another step in overcoming the city's downtown parking problem. As recently as five years ago, merchants in downtown Salt Lake City were faced with the very real possibility of being "abandoned" by customers because of inadequate parking facilities in the area. The new building, to be known as Walker Center, will accommodate more than 500 automobiles, and will be the fifth parking structure to be erected in the downtown area within the past five years.

Low bid for construction was submitted by Jacobsen Construction Co. of Salt Lake City.

Modern painting on hydro projects

Protective coatings for exposed steel, and methods of application have been undergoing rapid improvement during recent years. New coatings when properly applied are producing longer and better service at lower final cost. Present specifications are usually outmoded. Engineers should be informed on the new coating products, and general contractors should be familiar with present field procedures and equipment.

By **LELAND M. WISCOMBE**
President, Wiscombe Painting Company
Salt Lake City, Utah

IN ONE short decade, science and technology have made major advances in materials, methods and equipment for painting hydroelectric projects. This branch of painting, dealing with corrosion control under difficult conditions, has always been a specialty. Since 1950, however, it has been moving toward the status of a science. Some of today's techniques adapted to the coating of steel in dams and powerhouses are as exacting as a mathematical formula.

As a result of war-accelerated chemical discoveries, there are numerous tough new synthetic coatings which not only require but deserve this careful treatment. And we now have in practical use good mechanical equipment for reaching areas without the former strains and hazards, and high powered devices for making fast, perfect surface preparations and coating applications. Such equipment did not exist in the 1940's.

Painting becomes chemical

Every successful painting contractor has had to acquire a considerable knowledge of chemistry. To apply correctly the various new coatings he has had to gain technical understanding of their composition and reactions. Consequently, there is a new vocabulary in painting today. Contractors are using chemical terms as glibly as they once talked about brushes and linseed oil.

During the past ten years my company has completed 29 major painting contracts on public and private power projects in most of the Western states. We have used all of the new synthetic materials, and are convinced of their superiority. So when I see most hydroelectric painting specifications still coming through with only "coal tar enamel" and other traditional coatings stipulated, I have the unhappy feeling that the great strides of the painting industry are being blocked at a vital point—not intentionally, but because we have failed to sell the engineers in charge of these projects.

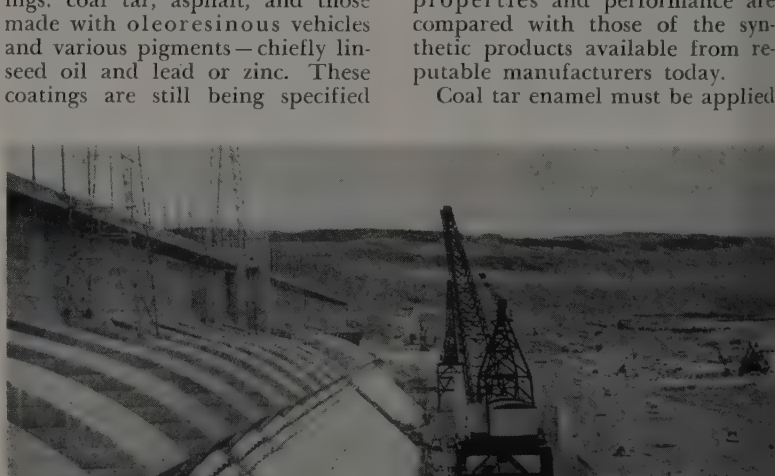
In such cases we have much more to offer than we are asked to provide, and the owner is deprived of the greater durability and economy of the newer materials.

The older materials and results

Until 1940 the painting of dam and powerhouse elements was limited to three basic classes of coatings: coal tar, asphalt, and those made with oleoresinous vehicles and various pigments—chiefly linseed oil and lead or zinc. These coatings are still being specified for the majority of hydroelectric projects.

A very thick coat can be obtained with any of these traditional materials, and in many instances they have performed well, largely because of the thickness of the coats and because normally the environment is not a severely corrosive one. On steel surfaces which will be submerged, the coal tars and asphalts usually are applied from 1/16 in. to more than 1/8 in. thick. Three coats of linseed oil and paste white lead or red lead compounds, which have a very high solids content, attain thicknesses ranging from 8 to 12 mils when properly applied. Each of these traditional coatings can be shown to have many deficiencies when their application, properties and performance are compared with those of the synthetic products available from reputable manufacturers today.

Coal tar enamel must be applied



INSIDE coating on these sixteen 25-ft. diameter penstocks posed a preparation problem on the 42-deg. incline. Mechanized equipment for sand-blasting reduced time required and improved the condition of the steel surface, as compared to older hand methods. Penstocks are at Chief Joe Dam built by the Corps of Engineers.

• Providing the Steelwork for Today's Modern Dams

Equipment totaling $4 million was supplied by Yuba Manufacturing Division for the huge Ice Harbor Dam project on the Snake River, Washington.

Ten giant Yuba-built spillway tainter gates, 50 feet wide and five stories high, weigh 145 tons each.

Each radial gate was assembled at the plant, match marked, then disassembled and shipped on gondola cars to the site—four cars to a gate!

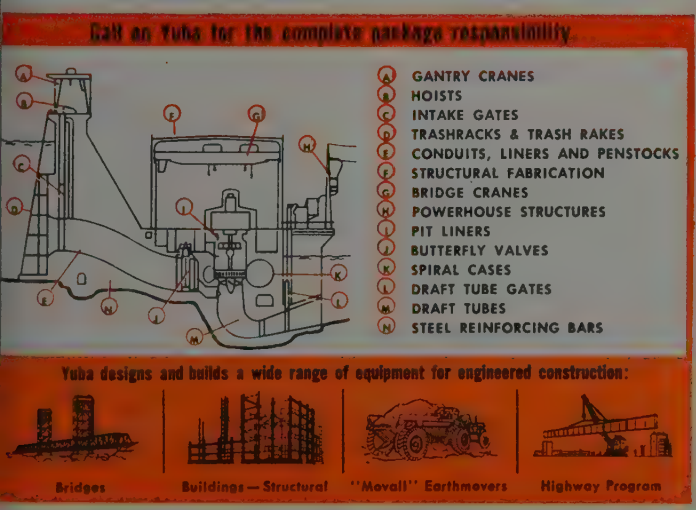
• From Forebay to Tailrace
• Design • Fabrication • Erection

The giant radial gates shown here, the massive trash racks, he draft tube, traverse and intake bulkheads, and a number of ther steel fabricated components totaling 44 in all, were pro-uced by Yuba Manufacturing Division.

This enormous project of the Army Engineers is typical of the nany dam construction jobs in which Yuba has been a major articipant. The reasons: decades of experience in this special-zed field; real know-how of its skilled personnel; large, fully-quipped production facilities—East and West.

Where user and contractor want relief from coordinating pro-uction, delivery and installation, they can call on Yuba to andle the complete job as a package responsibility—from fore-ay to tailrace—through design, fabrication, erection.

Ask for Bulletin No. HY-51, describing Yuba's hydroelectric quipment and services, or ask for a sales engineer to call.



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FROM wet-to-dry and from cold-to-hot, exposed steel on a hydroelectric project represents a problem in selection and application of protective coatings. Modern materials are providing better service. Vinyl type of paint was used on these spillway gates at The Dalles Dam, built by the Corps of Engineers.

manually under the most strenuous conditions, the applicator's view of the surface being completely obliterated by noxious smoke during most of the operation. As for service, claims in excess of 40 years have been made; yet I have seen coal tar enamel failures on important projects in one to 10 years, even though the application was made with materials and workmanship conforming to the rigid Federal requirements.

It is true that under laboratory conditions nearly perfect coats can be obtained with coal tar enamels. Unfortunately, dams and powerhouses are not built where the temperature can be maintained at 77 deg., the humidity below 50% and the air free of dust. Whether it be warm, cool, sweltering or freezing, the coating of steel surfaces on these huge construction projects must be performed in accordance with the general contractor's work schedule.

Asphalt paints tend to absorb water in proportion to the pressure exerted on them under water, and when they are exposed to sun and air the volatiles escape and leave a dry coat. In these respects, the asphalts tend to be inferior to the coal tars. Like the coal tars, they do not perform well on surfaces ranging in temperature from below freezing to above 80 deg.

Linseed oil and red lead mixtures have a long history of good service on dams and powerhouses. But the old type red lead paint that was made on the job from pure boiled linseed oil and red lead, and met a rigid standard, may not be the same product used on a job for which "Red Lead & Linseed Oil" is specified. This is because we now have more than 36 different linseed oils varying from pure to a 70% dilution. We also have, today, at least 16 types of red lead. What oil? What lead?

Some of the modern formulations are better than the older types, the chief value of which was the high solids content which gave the paint a poor spreading rate resulting in a very heavy film. Today we use new additives to counteract the tendency of pure linseed oil and red lead to emulsify under water and become soft after a period of time. But today's good hiding power and spreadability often result in a poor film build.

The modern coatings

Chemists in paint laboratories in the United States have developed not only additives to correct these undesirable paint tendencies, but at least ten entirely new types of coatings derived basically from the plastics and synthetic rubbers.

These coatings are classified as: Alkyds, chlorinated rubbers, epoxy resins, neoprenes, phenolics, polyethylene, styrene copolymers, high solid polyesters of the isolite styrene monomer type, urethanes and vinyls. Each type of coating may be impregnated with common pigments.

If correctly applied, most of these new materials will control corrosion in conditions such as the dam environment for a great many years under any and all stresses. Some are notable principally for acid resistance, a factor more important in industrial operations than in dams. In my opinion, five of these coating types are most suited to power project painting and will provide more perfect coats than, and give service superior to, any of the traditional materials. I will discuss each briefly:

Alkyd paint systems generally are better for steel exposed to atmospheric conditions than the oil-based paints. The alkyds can withstand extreme weather exposure, have long life and provide a beautiful finish for machinery, turbines and generators.

Phenolics are especially good for structural steel immersed, or intermittently immersed, in fresh water. Surfaces must be sandblasted to receive the phenolic coatings, and the intermediate and finish coat should be applied within two or three days after the base coat.

Poor results often are obtained with phenolic shop coats because they become too hard before the field coat is applied, and the two fail to bond satisfactorily.

Vinyl chlorides at present are the most widely used synthetic for per

Knuckles right down to any job!

This rugged heavyweight asks no quarter, it just wades right in and polishes off tough hauling jobs. Two high-capacity "live" rear axles give it better flotation and traction on soft ground. And its 234-hp. engine, with dual carburetors standard, gives this T900 tractor the big-chested power to handle the big hauling jobs without tiring.

The new Dodge tandems are packed with features that make heavy-duty hauling easier and more profitable: New instrument clusters, with tachometer and graduated ammeter and oil pressure gauges standard . . . suspended brake and clutch pedals . . . 90-degree-opening hood for easy servicing . . . air brakes standard on T900 models . . . up to 20 speeds forward. But see your Dodge dealer—and get the *heavy-duty* reasons why . . .

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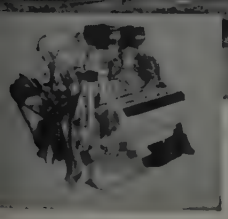
it's real smart
to choose **Dodge Trucks**



Built throughout for dependable heavy-duty service, this 354-cubic-inch V-8 has dome-shaped combustion chambers . . . double rocker-arm shafts . . . precision timing gears instead of chains . . . positive exhaust-valve rotators . . . hydraulic tappets . . . sodium-cooled exhaust valves. And it develops full power on thrifty *regular* gas!

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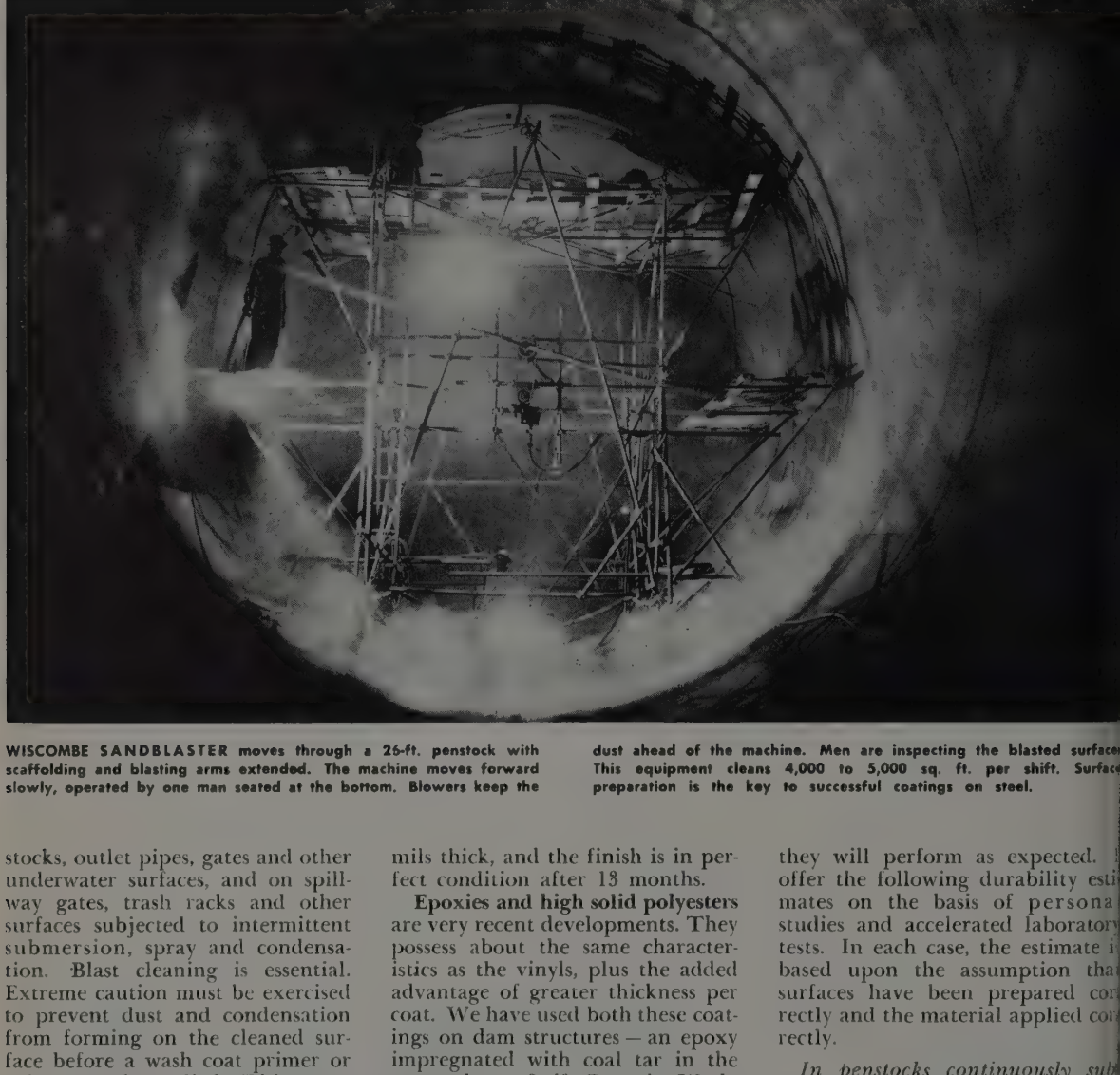


WISCOMBE SANDBLASTER moves through a 26-ft. penstock with scaffolding and blasting arms extended. The machine moves forward slowly, operated by one man seated at the bottom. Blowers keep the dust ahead of the machine. Men are inspecting the blasted surface. This equipment cleans 4,000 to 5,000 sq. ft. per shift. Surface preparation is the key to successful coatings on steel.

stocks, outlet pipes, gates and other underwater surfaces, and on spillway gates, trash racks and other surfaces subjected to intermittent submersion, spray and condensation. Blast cleaning is essential. Extreme caution must be exercised to prevent dust and condensation from forming on the cleaned surface before a wash coat primer or prime coat is applied. This material should be applied in multiple coats 5 to 7½ mils thick.

Our own most notable vinyl project was at Garrison Dam, where we applied eight carloads of this coating to three penstocks and six surge tanks. The interiors of two penstocks were coated during the winter months when outside temperatures ranged from zero to —30 deg. The original specifications had called for coal tar enamel, which would have been impossible to apply at such temperatures.

The vinyls are tough. All other coatings had failed in one to six months in the circulating water lines and condensers of the Utah Power & Light Company's 240,000-kw. steam plant at Salt Lake City. We applied four coats of vinyl 5 mils thick, and the finish is in perfect condition after 13 months.

Epoxies and high solid polyesters are very recent developments. They possess about the same characteristics as the vinyls, plus the added advantage of greater thickness per coat. We have used both these coatings on dam structures — an epoxy impregnated with coal tar in the penstocks at Swift Dam in Washington, and a polyester with a finished thickness of 25 mils at Cochrane Dam in Montana.

This latter application was to spillway gates. Logs, trees and debris go over this spillway every spring, and the temperature range of the environment is from 100 deg. to —45 deg. We were instructed to apply a high solids polyester with a Fiberglas cloth between coats. Although I felt that the particular type of polyester was too brittle, I am convinced that this coating will remain in relatively good condition even with the stresses described for 20 years or more.

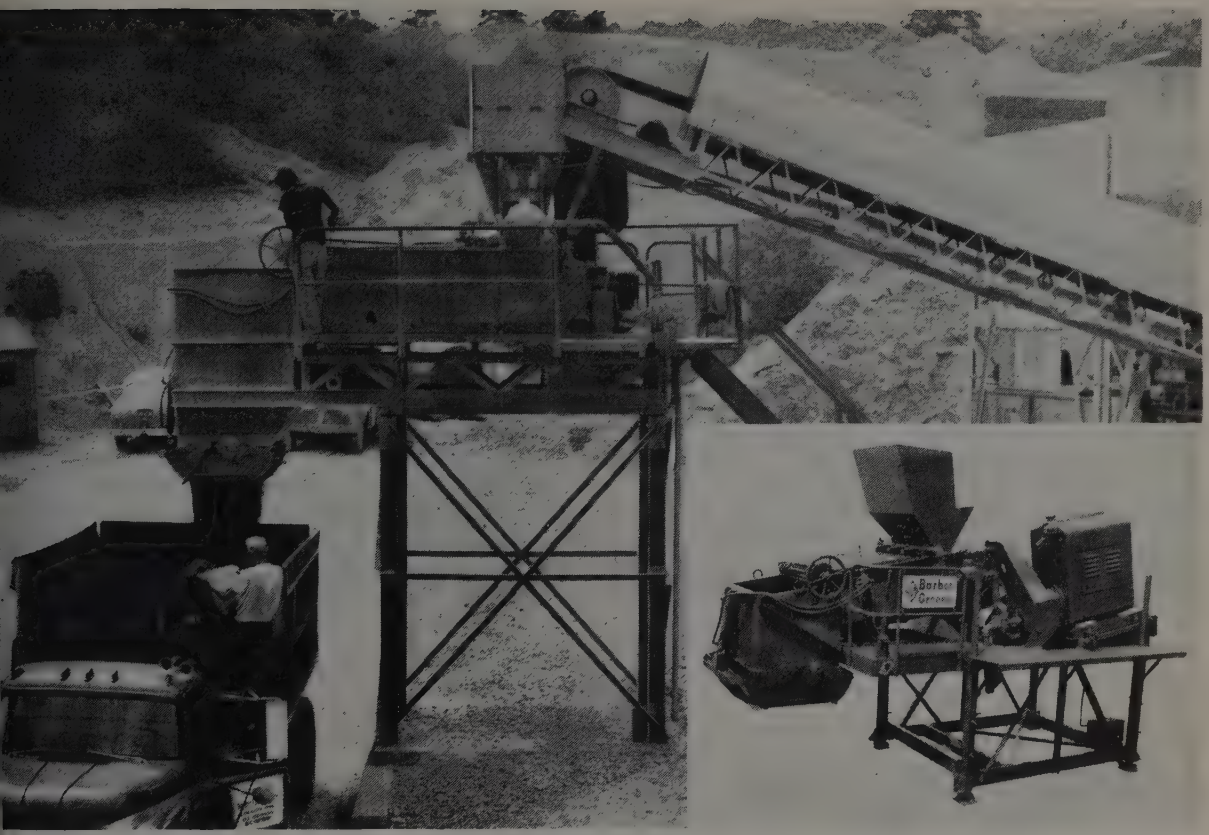
Durability of new coatings

The synthetic coatings are still so new that we cannot be certain they will perform as expected. I offer the following durability estimates on the basis of personal studies and accelerated laboratory tests. In each case, the estimate is based upon the assumption that surfaces have been prepared correctly and the material applied correctly.

In penstocks continuously submerged, phenolics with red lead 10 mils thick will last 10 to 15 years; phenolics with zinc 8 mils thick will last 10 to 12 years; vinyls 7½ mils thick will last 15 to 20 years; epoxies with tar 20 mils thick will last 20 years, and polyesters 20 mils thick will last 30 to 50 years.

Costs for each of these new materials are about the same, ranging from 35c to 60c per sq. ft., depending upon the area and working conditions. They will give the maximum performance provided by their manufacturers only if they are applied properly. Many have delicate formula balances and require rigid application techniques. Failures may result with even the best coatings if the surface is not properly prepared for painting.

(Continued on page 59)



One of the many high capacity Barber-Greene Model 828 Stabilization Plants now setting production records. Inset shows new Model 824.

New Barber-Greene Stabilization Plants provide record-setting capacity and economy

ost-conscious contractors everywhere are meeting in-reased demands for base material with new high-apacity, low-cost Barber-Greene Stabilization Plants. hese plants require less equipment and labor than on-the-road" mixing methods . . . deliver greater accu-cy in proportioning and water content . . . are less ependent on weather . . . consolidate material-handling. Model 828 exceeds highest tonnage requirements of odern highway construction . . . new Model 824 offers nple capacity for applications where extremely high nnages are not required, plus all the cost-cutting ad-ntages of the Model 828.

ecord production—many plants are producing over 0 tons per hour.

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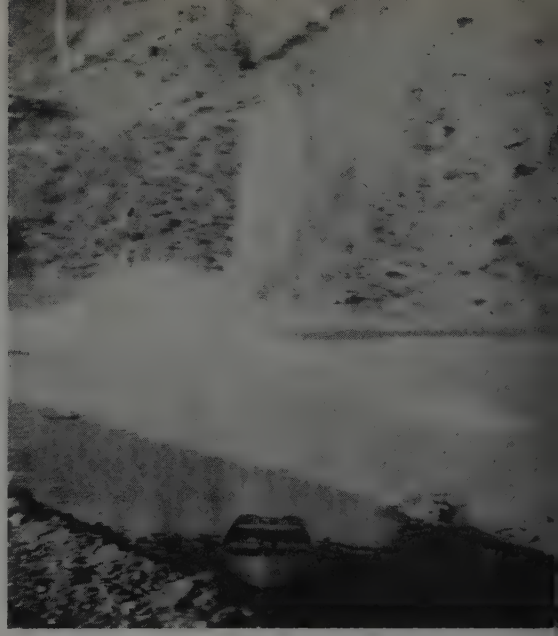
THE LAKE. Powdermen in boat tie a length of fire hose stuffed with explosive around the upthrust culvert. Water rose 40 ft.



THE SHOT. Ring of blasting gel is exploded beneath the "lak to cut off drain culvert at the elbow. Shot used 90 lb. of 60% g

The day the culverts went crazy

Giant multiplate culverts were bent up like stovepipes when winter rains hit Oregon's scenic Pacific Coast highway project. With drainage cut off, dangerous lakes formed behind two big fills. The 8-ft. tubes were sheared off with a fire hose full of blasting gelatin.

IN THEIR conquest of the rugged Oregon Coast, where a new section of US 101 will skirt the ocean, contractor Peter Kiewit Sons' Co., and Resident engineer, G. A. "Buck" Barnhart of the Oregon Highway Department have had more than their share of hell and high water:

Heavy-gage multi-plate culverts 96 in. in diameter were hit by winter runoff and bent upwards like stove pipes, creating dangerous lakes behind fill areas 150 ft. high.

A 250-ac. slide area moved the right-of-way 100 yd. downhill over night, balancing off the move by raising the ocean beach, ½ mile away, 30 ft.

Construction section is known as Burnt-Hill — Hooskenaden Creek, and is one of four active contracts extending from Pistol River to Brookings where a new ocean-front highway is being built. Financed by a $12,000,000 bond issue for a scenic road, it pierces an area of high hills and steep ravines along the rocky, eroded coast line. The region is subject to heavy winter rainfall which creates monumental runoff problems in the narrow canyons. The highway was located in this rugged area to fulfill its secondary function as a scenic attraction, as well as a major artery.

Original contract on the Burnt Hill section was $1,700,000, but additional work may bring the total cost to $2,000,000.

Complicating the steep cut, high fill construction was the fact that stream beds rested on unstable muck incapable of supporting the huge fills. A technique worked out for crossing these streams included these steps:

1. Gut out the canyons above and below the fill down to stable ground. To contractors asking how deep they would have to go, Barnhart, a veteran of many years of road building, replied, "As deep as necessary. Each creek has a different bottom, and you have to dig to find it."

2. Install 8-in. and 12-in. perf rated drain pipe along the ne creek bottoms.

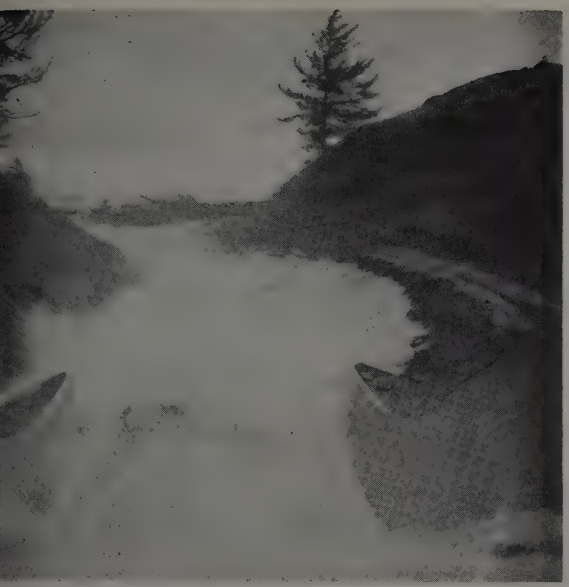
3. Random fill and compact level shelf filling the enti canyon to a predetermined heigh

4. Construct multi-plate culver of 90-in. or 96-in. diamet (usually in pairs) on the shelf, run beneath subsequent highw fill. Culverts are considerab shorter than an upstream she which acts as a settling basin f runoff water.

5. Fill and compact over culve and construct fill to grade.

6. Build downstream concre spillways from culverts to le water over toe of the shelf and in the ocean. (Dragon's teeth are s in the bottom apron to break scouring action of discharge wate

The 3.5-mi. section includ three major creek crossings of t nature, and the contract called f



HE DELUGE. Impounded water races down spillway at outlet end the 500-ft. culvert, pounding against dragon's teeth set in apron.

THE FILL as it now looks. Remains of pipes can be seen on shelf above. Same area under water shown at extreme left.

ıore than 30,000 ft. of 8-in. and 2-in. drain pipe plus some 3,200 ft. f structural culverts bid at $227,-00. Without the random fill bases, ulvert lengths and costs would ave been considerably greater.

Two installations, at Burnt Hill nd Whiskey Creek, were in place nd covered by partly completed ll when the hell and high water it last January. On the night of anuary 7, the winter floods hit ıe twin 96-in. culverts at Burnt ill and the single 90-in. structure t Whiskey Creek. In both cases, ater pressure forced these giant rains up through the sloping fill or about 40 ft. of their length, ending them like stove pipes. At urnt Hill, where the culverts are 19 ft. long, the bent sections were f uneven lengths so that one pro-uded about 6 ft. from the water, hile the shorter pipe served as a lory hole for the impromptu dam, s inlet about 6 in. below water vel. Neither pipe collapsed at the lbow." Corrugations compressed stretched to make the turn. At Vhiskey Creek, the single drain ad been bent nearly upright and rust partly out of the water.

On Saturday morning, engineers nd construction men gathered at ıe two lakes to try to save the ex-ensive fills being threatened by ıe water. L. R. "Pop" Chandler, ssistant Oregon Highway divi-on engineer, had been called om Roseburg district office, and od Miller, Peter Kiewit Sons' roject manager, along with Barn-hart and Guy Scott, construction superintendent.

Several possibilities were considered, including the idea of unbolting the dry pipe at Burnt Hill and pulling the bent section away with a crane. This was vetoed as too dangerous to the men who would have to work inside the pipe shearing off bolt heads and driving out the bolts.

Explosive placed

Ultimately engineers decided to try to blast the bent pipe ends loose, and calls went out to powder men all over the area. By Sunday morning they were ready to shoot. A length of 2½-in. fire hose was packed with 60% blasting gelatin and wired with prima cord and electrical circuits. Working from a boat, powdermen tied the hose in a ring around the pipe and gingerly worked it down about 40 ft. below the water level to the bend.

The shot sent up a tower of water. The pipe emitted one perfect smoke ring before it sank in its slings; and the impounded water began to move through the jagged culvert. Burnt Hill lake emptied

CULVERT under construction rests on random fill above original stream bed. Road fill will be placed over double structure. Photos all show same fill at Burnt Hill Creek on the Oregon project.

TRACTOMOTIVE charts th

These charts are your guide for choosing a bucket and a loader that is just right for your job. You will operate at highest efficiency with the correct size bucket and the right size loader — get the highest possible production. No costly maintenance from overloading! And your loader will last longer, too. There's a whole family of buckets to choose from for each machine in the 5,300, 7,000 and 9,000-lb carry class.

How to use the charts

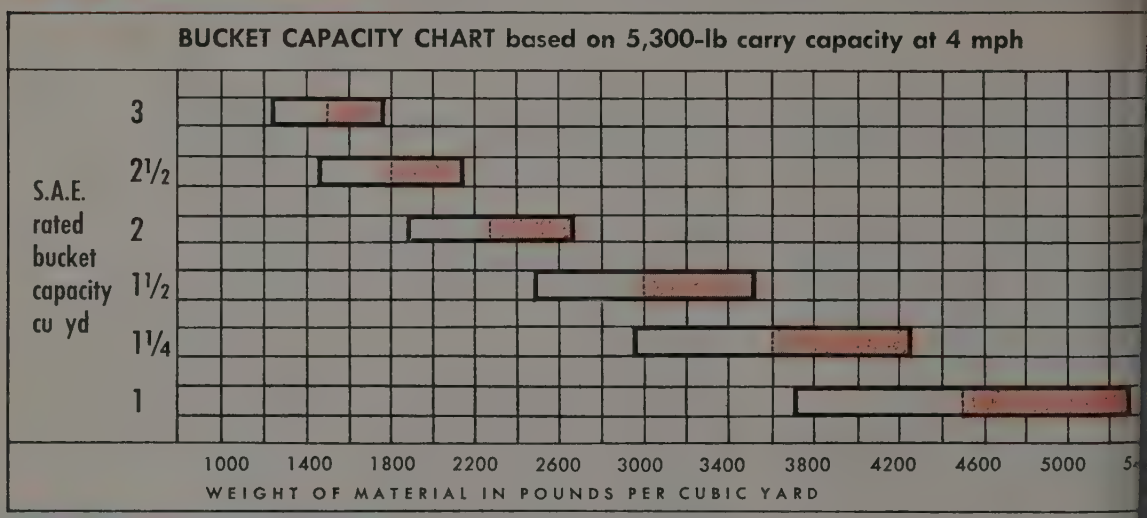
The bar opposite each bucket size shows the weight of materials per cu yd that you can handle with this size bucket. The area in color on the right side of the dotted line in the bar indicates the weight of materials that can be handled where loading is normal and operating conditions are good. The left side of the bar indicates the weight of materials that can be han where conditions are adverse — such as steep gra rough ground, or where you get excessive heapin

Example: Suppose you are loading sand weig 2,600 lb per cu yd. If your operating conditions good and you get normal loads, you would choose 3-yd bucket for the TL-20, the 2½-yd for the TL or the 2-yd for the TL-14.

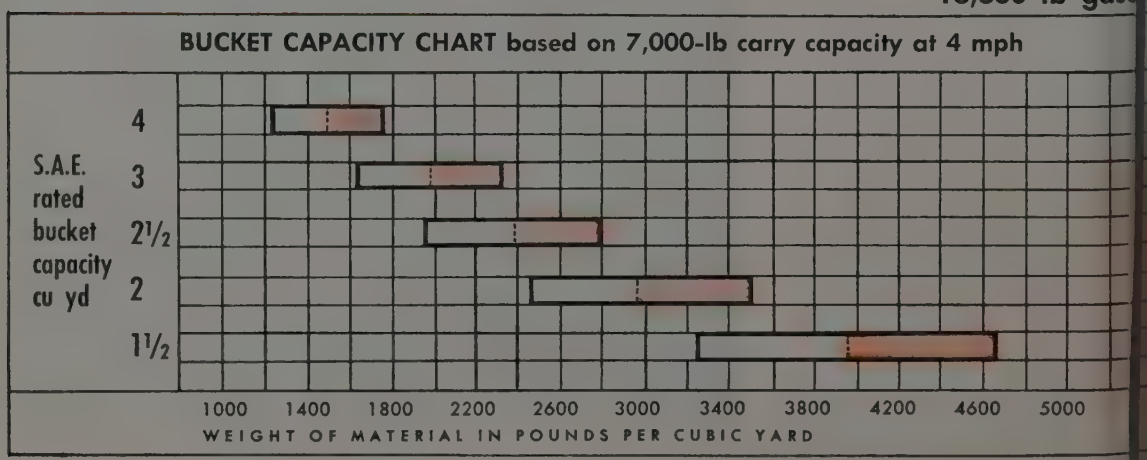
If your operating conditions are adverse or you excessive heaping, you would choose the 2½-yd bu for the TL-20, the 2-yd for the TL-16, or the 1¼ for the TL-14.

Your Allis-Chalmers dealer will be glad to go these charts with you . . . discuss your job req ments and help you select the most efficient size bu and loader for your work.

TL-14 TRACTOLOADER 81.5 hp diesel • 86 hp gasoline • Weight: 14,480 lb

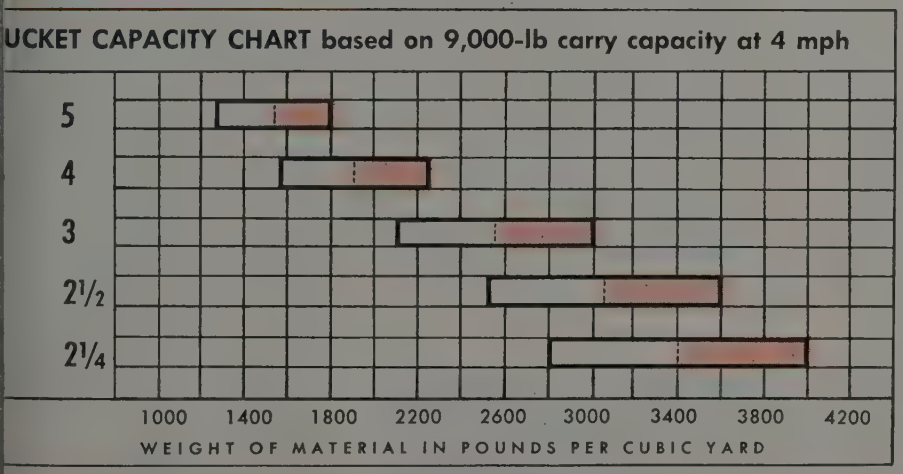


TL-16 TRACTOLOADER 104 hp diesel • 109 hp gasoline • Weight: 17,600 lb d 16,380 lb gas



ay to proper bucket selection

20 TRACTOLOADER 130 hp diesel • Weight: 23,150 lb



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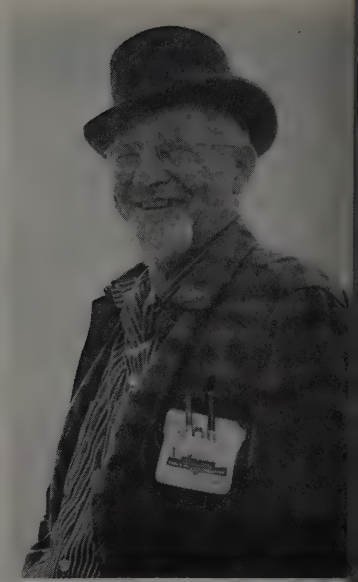
HOOSKENADEN Creek, draining part of the 250-ac. slide area will flow through these two 8-ft. diameter multiplate pipes. Channel will be filled in, and extensive fill placed over pipes.



RESIDENT engineer Buck Barnhart spe goatee and derby for Oregon Centenn

in 6-8 hr. The shot at Whiskey Creek was equally successful and both fills were saved.

A third big culvert installation, a triple, at Whale Head Bay on the adjoining Darkenwald & Harms contract, was caught in time and weighted down with additional fill.

Engineers still don't know exactly what caused the big culverts to bend. They believe the upthrust was due to the lowered pressure caused by drawdown in the intake end of the pipe in combination with insufficient weight on the outer ends of the structure. Fills were 40 to 70 ft. above the top of the culverts. This is more than enough to weigh them down after sufficient height of fill (6 to 10 ft.) had been developed on the slope.

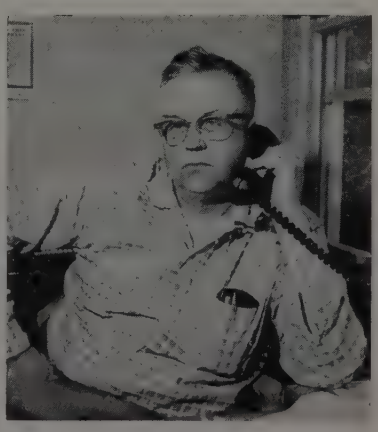
The remaining upthrust pipe at Burnt Hill was subsequently taken off by cutting off the bolts and pulling the bent section away. Barnhart noted that they practically had to blast that one too, since the interlocking construction of the pipe segments required a mighty heave to break them loose.

Culvert construction

A third double culvert installation, involving two 500-ft. multiplate pipes, was constructed this spring and Superintendent "Scotty" Scott put into operation several new techniques, developed on earlier multiplate construction to speed the work. These included actual location of the tubes which are placed about 15 ft. apart to provide clearance for a motor grader to compact the fill against the under side, eliminating expensive hand tamping sometimes used on earlier installations.

These pipes were backfilled in three days, two days preparing a ramp over the structures with two Cats and scrapers, one day with mechanical tampers under the haunches. Spread included six DW 21 scrapers, two D8 dozers, one D6 loader and one Caterpillar 12 grader. All equipment could go between the pipes and did.

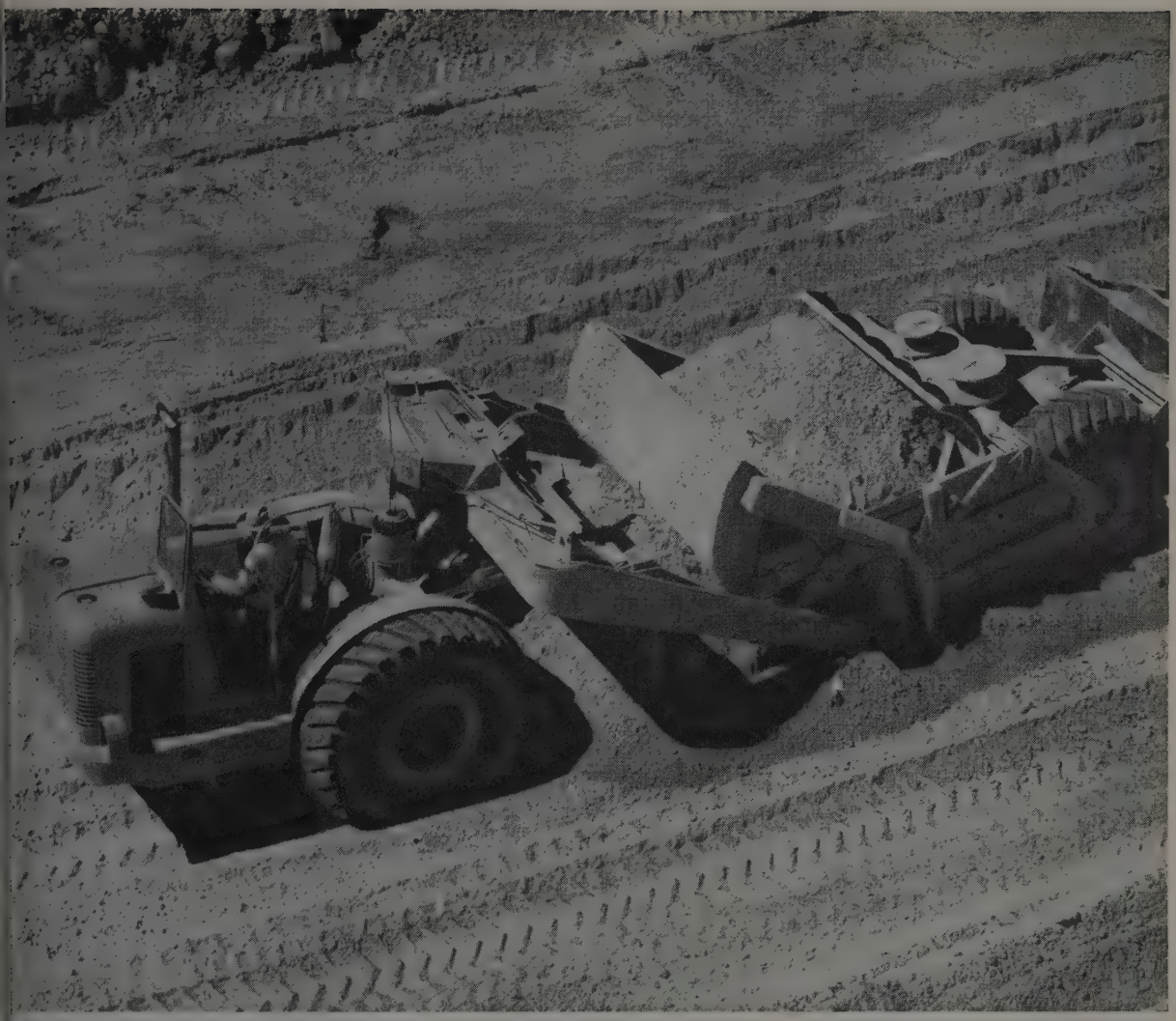
Plates are put together with high strength bolts by a team of men working inside and outside the pipe. Scott has devised a simple scaffold bracket to provide footi for the outside crew assembling t top panels. Bracket is flat st rectangle with a long hook bolt to one side. Hook is inserted i bolt hole on the outside of t pipe, and a plank thrust throu the rectangle, resting on the b tom edge. Brackets are used groups of three with overlappi planks suspended between the As the work progresses, planks a shoved ahead to clear the ba bracket which is taken off and placed at the head of the line a a plank pushed into it.



ASSISTANT district engineer L. R. "Pop" Chandler who supervised blasting operation.

Specifications require that t thousands of bolts be tightened 100-lb. pressure, and this is do with compressed air wrenches. A from a Gardner-Denver compres is delivered to a steel pipe ma fold which has connections for erating half a dozen wrenches multaneously. Only problem in t installation is keeping a stock wrench sockets, which split op after two or three hours of op ation.

The big culvert structures made 5% out of round and erec with the long axis up. The eli cal shape is preserved with he wooden beam strutting wedged place before backfilling. Press of backfill as it is brought up w good compaction will spring steel, taking some load off shores. After these are remov subsequent fill will squeeze culvert into circular shape.



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Firestone off-the-highway tires lower earthmoving costs by cutting downtime and staying on the job longer! Every Firestone tire is built with Firestone Rubber-X, the longest wearing rubber ever used in Firestone tires. Tough Firestone treads and sidewalls defy cuts in rubble and shale. And Firestone S/F (Shock-Fortified) nylon cord bodies withstand bruising shock and impact to deliver maximum tire life! Count on Firestone off-the-highway tires for new low costs-per-hour! See your Firestone Dealer or Store and ask about the full line of tubeless or tubed off-the-highway tires and Firestone on-the-job service.

Rock Grip Excavator Wide Base

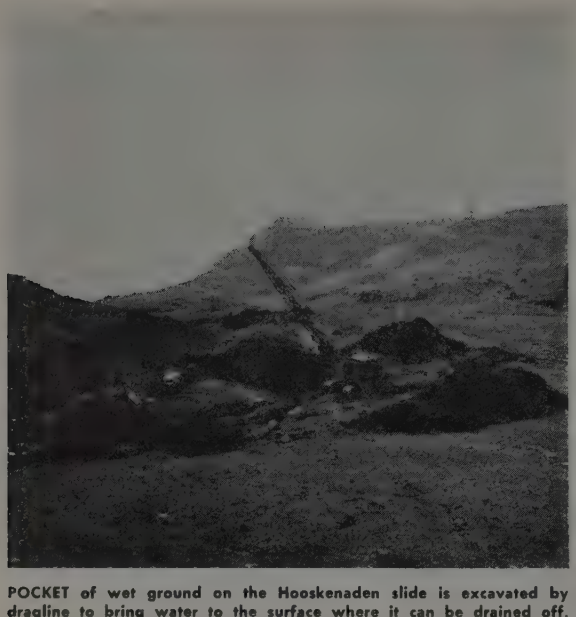
Rock Grip Excavator

When ordering new equipment always specify Firestone tires—available tubeless or tubed.

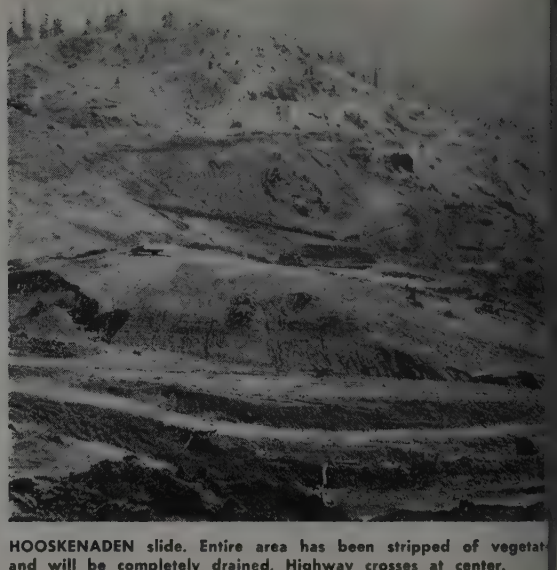
Firestone

BETTER RUBBER FROM START TO FINISH

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



POCKET of wet ground on the Hooskenaden slide is excavated by dragline to bring water to the surface where it can be drained off.



HOOSKENADEN slide. Entire area has been stripped of vegetat and will be completely drained. Highway crosses at center.

Stream crossings are only part of the problem on this job. There is still the Hooskenaden slide, a 250-ac. bowl of slippery material marching glacier-like to the ocean. Highway crosses the slide in a long curve about three-quarters of the way down from its summit. When the road was being staked, the slide sent the right-of-way down hill, and replaced it with material from above in almost exactly the same profile. In order to keep this from happening again, the slide is getting The Treatment. Entire area has been cleared, and grass seed and fertilizer sown over it from a helicopter. Engineers, soils experts and geologists have combed the area, probing for wet spots. Surface ponds are ditched and drained to the sides away from the critical road area. Swampy areas are being excavated, bringing the water to the surface where it can be carried off with drain pipes.

The Oregon Highway Department has developed a special slip joint drain pipe for such excavations. Each 20-ft. section is made up of 10-ft. normal diameter, 4 ft. of taper, and 6 ft. of 4 to 6-in. larger diameter. Each section slips inside the next, allowing 6 ft. of movement before the connection is broken. These culverts are used where movement or subsidence is anticipated. Many of the fills along the coast are constructed through fill areas as much as two miles long where whole mountains are moving to the ocean.

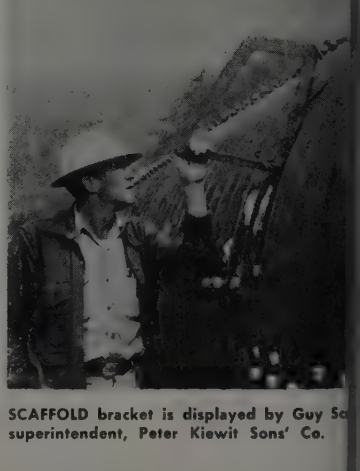
As there was no way to determine before hand how much work would be needed to dry out the Hooskenaden slide, 6,000 equipment hours were called for as a bid item.

Scott's earthmoving spread includes 5 DW21 Caterpillar scrapers; 5 14A Caterpillar graders, 1 D9 Caterpillar tractor and 1 Northwest 25 dragline. As soon as spring weather cleared, he began working two 9-hr. shifts, with a total of 25 operators.

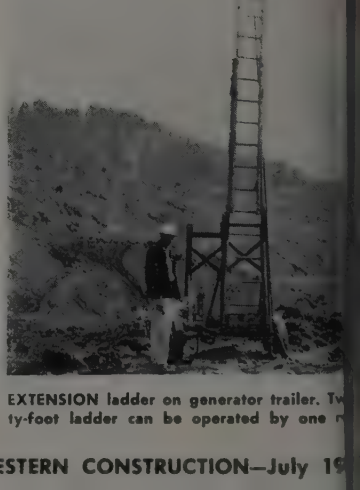
The night shift makes good use of another Scott invention, a mobile light rig made up of an Alman gasoline generator and a 20-ft. extension ladder mounted on a small trailer frame. Ladder fits upright into an angle-steel frame at the back of the trailer. A steel sleeve fits over the top of ladder, mounting two clusters of light sockets. For traveling the ladder pivots and rests on a bracket over the generator. Light cluster slips off and is disconnected for safe storage. The unit can be set up and raised into position by one man on the ground. Scott points out that value of lights on extension ladder is to get them up out of the operator's eyes.

Key men of the construction unit are Superintendent Scott, John Sharp, day foreman, Lester Shawl, night foreman, Dwane Shubert, multi-plate foreman, Bill Allen, office manager, and Eddie Thiel, master mechanic.

Oregon highway department men include Frank D. Morgan, division engineer, L. R. Chandler, assistant division engineer, Buck Barnhart, resident engineer, and R. R. Olsen, division soils engineer.



SCAFFOLD bracket is displayed by Guy Sc superintendent, Peter Kiewit Sons' Co.



EXTENSION ladder on generator trailer. Tw ty-foot ladder can be operated by one m

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- ☐ Eight-unit control manifold for convenient installation of extra attachments.
- ☐ Two-stick shift mechanism for the six-speed constant-mesh transmission.
- ☐ Full-floating rear axles.
- ☐ Extra-heavy frame, wt. per ft. 134 lbs.

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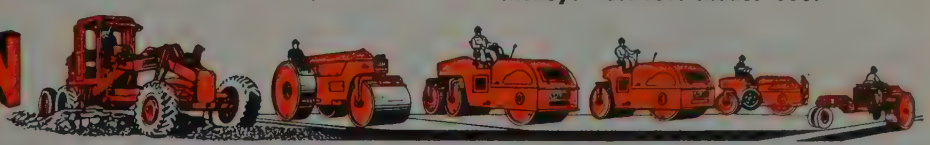

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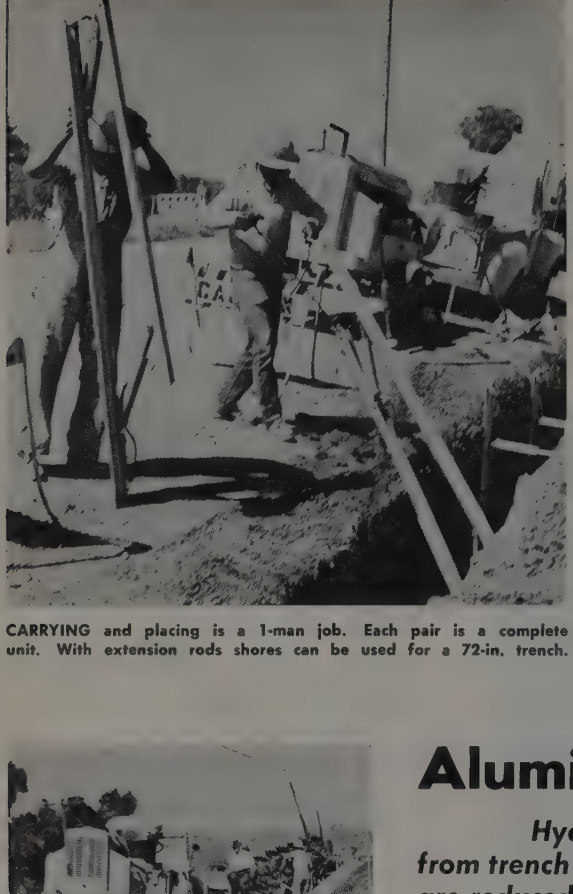
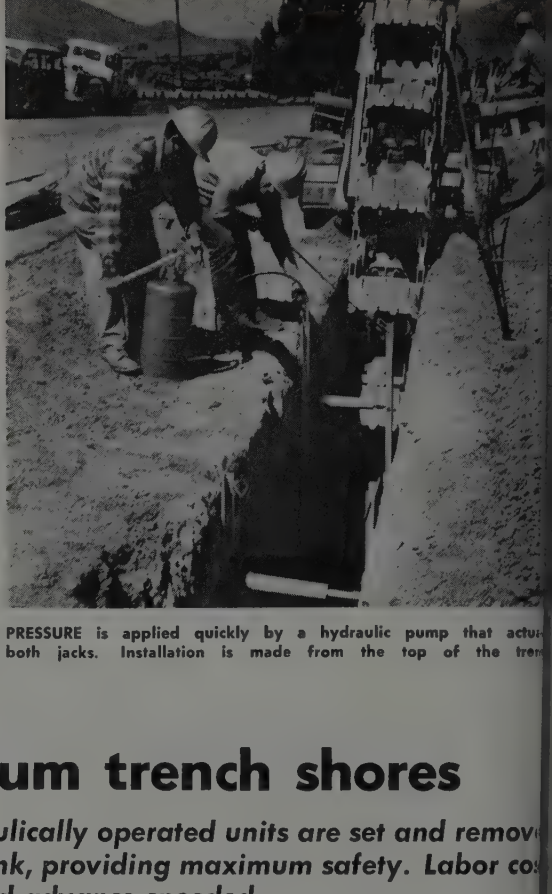


CARRYING and placing is a 1-man job. Each pair is a complete unit. With extension rods shores can be used for a 72-in. trench.



PRESSURE is applied quickly by a hydraulic pump that actu both jacks. Installation is made from the top of the tren

SHORING in place and ready for pipe laying. Note the bulge on the nearest shore.

Aluminum trench shores

Hydraulically operated units are set and remov from trench bank, providing maximum safety. Labor co are reduced and advance speeded.

USE of a new aluminum hydraulically-operated trench shore called "Saf-T-Jax" enabled MGM Construction Co. to reduce labor costs on an $85,000 sewer extension contract in Tiburon, Calif.

The contract covers installation of 7,000 ft. of pipe in trenches averaging 6 ft. deep across the steep hills of the Tiburon peninsula. The trench cuts through a clay type of subsoil over rock strata, and has a tendency to slide. Job superintendent Steve Miller averaged 400 ft. per day through the worst of this rock and clay structure. He credits use of the new shores for 150 to 200 ft. of this progress.

The aluminum trench shores consist of 2 bearing plates each 7 ft. long, joined ladder fashion by two hydraulic jacks positioned about 2 ft. from either end. These hydraulic units are mounted with a clevis and pin arrangement so that the entire shore assembly will fold flat. These features of the Saf-T-Jax permit them to be installed close behind the ditch Dropped into position, bear faces are positioned against sides of the trench and the hydraulic cylinders expanded b portable pump through a sin coupling at the top of the sh Shores can be installed from top of the trench without exp ing a man to danger of cavein the bottom of the trench befor is supported.

The hydraulic cylinders use o nary diesel fuel as the fluid. W the shore is removed from trench both cylinders are bled multaneously by using a rod v a valve fitting mounted at the Fluid is allowed to bleed off is replaced the next time the sh are set. Shores are easily remo from the trench with aid of a rod which has a hook welde the end. Hook is used to pull opposing plate forward and lapse the unit so that it can hauled out. All of these operat are clearly shown in the acc panying illustrations.

The shores were designed

MY JOB FOLLOWS ME... since I put my home on wheels!

This is the life! *Now* when I change jobs it's easy to change my home's location too. No more scrambling for a place to stay, worrying over how long it'll be before the wife and kids can follow along.

Where else and how else can a man keep his freedom to choose a job he likes, and still know the pleasures of home life? I've got roots, I'm as stable as any land—or job-bound citizen. And after a day sweating over a hot line or moving plenty of earth it's soul-satisfying to have my home close by to unwind in—a hot shower, a big easy chair to sink into, and seconds after I've got my feet propped up on the hassock, the wife's got a cold beer in my hand!

She's happy too, naturally. She's got as modern a kitchen as any we've ever seen, and as pretty decorated a house as she could wish for.

There's plenty of space for the kids (separate bedrooms!) and a living room large enough for partying. And we've saved so much since we've owned our mobile home that we've got a new car, plenty of insurance and a bank account that guarantees the kids a good education.

Our park neighbors got their information from a local dealer—found him in the yellow pages. We wrote the Mobile Home Division of the Trailer Coach Association. Step inside some mobile homes—our bet is you'll buy one.

CONTRACTORS: Your most dependable employee today is *the man with the Mobile Home.*

Within one day he can be completely and comfortably moved to the job site—no packing up, no furniture moving or storage problems, and no days wasted looking for a new place to live.

Best of all, his family moves with him, bringing all the comforts of his luxurious and modern mobile home.

A normal, stable and comfortable family life means fewer days lost to illness. He can devote all his energies to the job, undistracted by personal inconveniences.

If you have employees with housing problems, write for additional information and reprints of this ad.

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MUDHOLE caused by underground spring makes tough going for trencher which gets extra pull from tractor. Cave-ins are likely here.

SPECIAL placement of shores on diagonal directly over boom preve cave-in of slippery ground as trench cuts through the mudhole a

developed by Darien Bennett, a young construction engineer who has formed his own company, Sigma Engineering Corp., to manufacture the units in San Jose, Calif. Miller has developed a number of new shoring techniques in using the lightweight assemblies. These include setting a shore on a diagonal immediately over the boom of the trencher in muddy going to prevent caveins over the boom. Half a dozen of these diagonal shores may be set to get the trencher through a wet area. They can later be replaced by upright shores.

The contractor's equipment on this job included a Parsons Trenchliner, D4 Caterpillar dozer, a Michigan Loader, and Hydro Hammer. The Hydro Hammer is used as a pavement breaker where the new sewer line will cross existing streets. The dozer does double duty benching a path across the hillside ahead of the ditcher and then backfilling the completed trench.

Miller had high praise for the safety features of the one-piece aluminum trench shores. He noted that the most dangerous job on a trench project is setting jacks for wooden shores at the bottom of the trench. Caveins are most likely to occur at this point, he said, because the trench walls are unsupported. Since the Saf-T-Jax are set from the top this hazard is eliminated, he said.

Depth of the trench was maintained by use of a string stretched along the side. This is followed by a target attached to an L-shaped bracket on a long rod fixed to the trencher boom. The operator sets his target just over the string and follows that grade line by raising or lowering the depth of the trenching boom.

The vitrified clay pipe used on this job is equipped with wedgelock plastic seals which saved many hours of labor. Seals are rings, factory installed in bell and around spigot ends of each joint. These are so positioned that when two joints are put together the spigot ring is forced inside the bell ring and makes a tight joint. The only lubrication needed is water. Joints can be offset to a substantial degree and still remain tight. Individual sections of pipe are 4 ft. long and can easily be handled by one man.

Key men for MGM Construction Co., assisting Steve Miller, superintendent, include Art Lanford, labor foreman; Gilbert Isabell, trencher operator, and Fred Baroni, equipment superintendent.

DARIEN BENNET, inventor of the trench sh demonstrates the quick-coupling connec

REMOVAL of the shores is one of the important features and advantages. The fuel oil is released and wasted. A simple turn of the valve, as demonstrated by Steve Miller, superintendent on the project, permits the shoring unit to be collapsed and removed from the trench without a man entering the trench.

New 45 Ton Lorry Crane extends the INSLEY line

ersatility, performance, long life—these are the features of the w Insley 45. This new truck crane not only is rated at 45 tons it *works* at 45 tons. What's more, the Insley 45 is "power atched" to capacity for maximum operating efficiency. The gged components of the 45 stand up under the severest condi- ns for continuous "day in and day out" operation and bigger ofits. Besides these features, here's a host of other advantages u'll find in the new Insley 45:

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FALSEWORK TOWERS (arrows) made of angle iron were used to support truss sections until field connections were made with high strength bolts. Towers were light, could be moved easily. Fe center trusses are spaced at 50 ft. and span 315 ft.

Largest roof trusses span 315 ft.

Three simple support towers are key to erectio of record breaking roof trusses for Sports Arena. Constru tion of concrete bleacher seats and walls is speeded b extensive use of tubular scaffolding and prefab form

HOW DID L. E. Dixon Co., the general contractor on the Los Angeles Memorial Sports Arena, get three months ahead of schedule? The construction of this huge structure, which presents unusual problems because of its size and its two-level elliptical shape, began in April 1958 and is slated for completion in July 1959.

The contractor gained time by thorough advance planning and the coordinating of all subcontractors. Specifically, an easy method of erecting the huge 315-ft. long roof trusses was devised involving the use of simple temporary tower supports; and extensive use was made of prefabricated products — steel panel forms for the walls, steel forms for the bleacher seats, and tubular steel scaffolding for shoring. The first concrete pour for the bleachers was very carefully studied to find the best method of forming and shoring; and the overall job was planned so that as many phases of the work as possible could be carried on simultaneously.

The project is located adjacent to the Los Angeles Coliseum and is the result of a $7,000,000 bond issue voted by the City of Los Angeles in 1957. The amount of the present Dixon contract is $5,107,-200. Seating for sporting events will range from a minimum of 16,000 for hockey up to a maximum of 30,000 for conventions, boxing, etc. Area available for trade shows will be close to 200,-000 sq. ft. The same equipment used to freeze the ice rink will also completely air condition the building.

Principal features

In plan view the building is roughly elliptical in shape, 405 ft. wide, 500 ft. long, 80 ft. high and 24 ft. below street elevation. More than 1,500 tons of steel are in th structural framework supporti the roof.

The roof is carried by 8 ste trusses ranging in size from 1 ft. to 315 ft. long. Lower cho members of the large trusses ran from 14WF219 to 14WF314. the upper chord the sizes ran from 14WF211 up to 14WF31 Spanning between the trusses a bent-bar steel joists. The 16 c umns supporting the ends of t eight trusses are composite in c sign, consisting of a 30WF172 wi eight No. 11 column bars imbedd in concrete.

Kaiser Steel Co. was the fabri tor and erector for the structu steel. The trusses arrived on t project in five sections. All fie

onnections were made with high-ensile bolts.

Erecting the trusses in sections equired three points of temporary upport. This need was filled by 0-ft. high towers constructed en-irely of Kaiser angle iron. The owers were 2 ft. square, mounted n 12-ft. square timber bases.

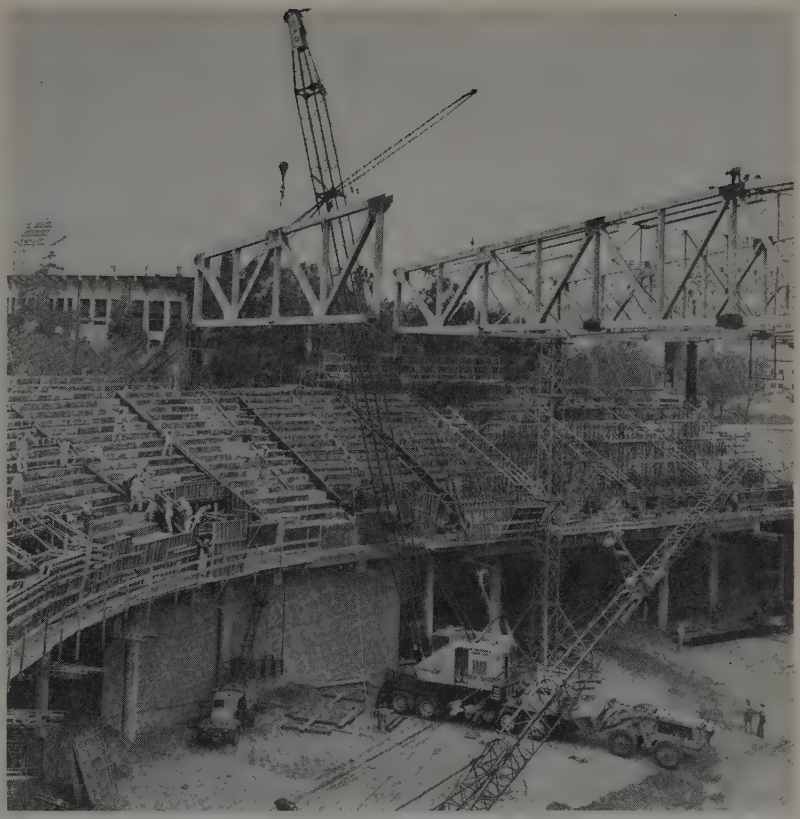
The truss sections were lifted nto place onto the temporary sup-orts by two cranes working in nison, a P&H 75-ton with a 175-. boom, and a Lima 60-ton with 150-ft. boom. The largest lift was 5 tons.

The pouring of all concrete was y cranes.

Concrete for the columns, leachers and outer perimeter wall as designed to have a 3,000-psi. rength at the end of 28 days. Av-age strength at 28 days was 3,950 si. Slump varied between 3 and in. A typical mix contained 5.8 cks of cement per cu. yd., with ozzolith, a product of Master uilders, added for workability. laximum size of aggregate was ¾ .

For forming the outer perimeter all the contractor used 2½ x 2½ . "Economy" panels throughout.

The bleachers are supported on x 3 ft. reinforced concrete girders ng on spandrels between wall olumns and spaced about 28½ ft. part on the straight sections of e arena and at 10 deg. 10 min. ound the radii at each end. Pour-g the bleachers was done in sec-ons about 50 x 85 ft., running om the top of the wall to the ain aisle. The pouring areas ere wedge-shaped at the curved ds of the arena. The contractor d enough "Patent" scaffolding hand to shore about seven such



TRUSS SECTION is lifted into place by P&H truckcrane. Trusses arrived at site in six sections, were erected in four. At left steel forms are being placed for bleacher seats.

sections and enough steel forms to form about five. The steel forms were constructed by the Steel Form Co. of Los Angeles.

The first bleacher pour was watched carefully to determine how much thrust the sloping concrete would exert on the scaffolding and also to find the best manner of pouring and finishing. It developed that pouring should be done from the top of the bleachers downward because this enabled the finishers to work on the unpoured treads below.

Architects for the project are Welton Becket & Associates. Structural engineers are Brandow & Johnson.

For the L. E. Dixon Co., builders, Ray L. Otti is superintendent.

For the Los Angeles Coliseum Commission, Ted Neiderhofer is resident engineer.

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The ONE FORTY FIVE power train is built for long grading service Simple, dry-type, ceramic-lined clutch; constant-mesh transmission; heavy-duty gear train — all much stronger than you usually find in a grader this size.

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WYOMING
Studer Tractor & Equipment Company—Caspe

. . . for more details, circle No. 25 on Reader Service Post

COATINGS

(Continued from page 38)

If any reader visualizes dam ainting as the application of paint y means of brushes held in the ands of painters, he is about 90% ehind the times. Power-painting the rule today. Even the spray un has evolved into an enor-ously complex piece of powered quipment. Numerous studies have own that, when properly used, praying provides a more uniform at than either the brush or the ller.

The brush is still used for small im and on areas required to be ushed by the specifications or ion agreements, but even the ighly skilled mechanic cannot oid rubbing the edges of steel apes almost bare with the brush. ost of the deterioration of ushed paint coats on steel is und on edges, around bolt heads d on welds.

It no longer is necessary to thin int for spraying. Today, with gh pressure pumps or airless ray equipment, even the heavy stics can be sprayed with com-ete success. In addition, the owing demand of corrosion en-neers for measured dry film thick-ss has made it unprofitable for e painting contractor to thin the ating. He in turn restrains the urneyman from thinning it to ke it work easier. Use of paint aters on spray equipment now kes it possible to apply twice the ount of paint with a single pass at formerly could be applied by ush, roller or cold spray.

There can be little doubt that, all practical diameters, mech-ized rotary spraying is the ideal plication method inside tubular uctures. In projects of the mag-ude of hydroelectric develop-ents, today's painting requires vanced equipment in addition to undant ingenuity.

The old cables and kick planks d bos'n chair have been replaced th air- and electricity-operated ges, and mechanized equipment n perform rapidly the cleaning d coating procedures that were time consuming.

uipment is key to speed

Ten years ago production figures sandblasting to base metal nged from 500 to 800 sq. ft. per ft per nozzle-man. Today our m is blasting 4,000 to 6,000 sq. ft. per shift, and doing a better job with automatic rotary sandblasters, improved nozzles and double-acting, continuous-operating sandblast pots.

We consider our Wiscombe Sandblaster (see illustration) a most advanced piece of painting equipment. It can sandblast penstock or other tubular interiors 8 to 10 times faster than a man, at the same time providing a moving scaffold for continuous inspection of the work while powerful blowers keep the dust forward. Adaptable to pipe diameters from 30 in. to 30 ft. and inclines from 0 to 90 deg., this sandblaster travels smoothly at controlled rates from 3 to 30 ft. per hr.

Getting to the surface has always been a problem for the painting contractor. A large diameter penstock or pipe at a 50-deg. incline presents scaffolding problems and involves costs entirely foreign to the architectural painter. With the aid of power stages, these difficulties no longer consume so much time. Hours that used to be spent moving stages and platforms are now devoted to sandblasting or applying paint, while the power moves painters, materials and equipment.

High-powered blowers, flood lamps, pressure pumps, spray guns, air hose and scaffolding are standard painting equipment on every dam project, and today a painting contractor may also have electric motors, winches, tuggers, transformers and thousands of feet of electrical cord.

Proper surface preparation

Successful painting, now as before, depends upon a very simple thing. There is no substitute for proper surface preparation to receive the paint; all the complicated equipment of modern painting will not secure a good finished paint job if the surface was not well prepared for the prime coat. In dams and powerhouses, preparation of the steel surfaces is of tremendous importance, particularly where accessibility is limited or where repainting would cause a shut-down.

Tests have been made which prove that sandblasting increases the life of a two-coat paint film 5.25 times over the life of the same paint applied to a weathered, wire-brushed surface. Just as modern methods have lowered the costs of good painting, so have modern sandblasting methods lowered the

costs of proper preparation f painting. Sandblasting is bei done today for less surface pre aration cost than the customer w paying 15 years ago.

The problem of proper prime

All too frequently steel ite come to the job with a prime co of improper paint which was a plied in the shop over a poor prepared surface. The prime co is burned, welded, bolted, groute in—damaged beyond recognition before it is sent to the field.

It is essential to know that *t prime coat is the most importa one.* A cardinal principle of pai ing is to apply coats in successio fast enough to prevent deterior tion of the preceding coat. Th rule is constantly violated wh steel is shop-primed.

Shop prime-coat problem

Normally shop-priming cann be done for less cost than fie priming if the same standards a applied to both. The cost of r pairing abraded areas more th offsets the expected saving, whi is based upon the lower wag usually paid the shop painter. A other disadvantage is the divisi of responsibility created by t practice. Who is responsible f failures, or lack of bond and pe ing, or inadequate film buil Altercations arise which result claims and back charges which t often are paid by the owner.

One agency places from 50 100 items in one category with specification which says, in effe "If unprimed, prime it and ap two finish coats. If shop-prim touch up the primer and apply t finish coats. If shop-painted, to up the finish coats." To com cate the picture, it is not kno how or where these items will purchased at the time of biddi Only a prophet could present intelligent bid on such work. T confusion can be prevented by c fining surface preparation and subsequent painting under one sponsibility.

Fuzzy specifications

The painting trade probably more trouble with fuzzy specif tions than any other branch construction. We are to blame this, since we have only rece developed standards comparabl those of other crafts. And m engineers are not yet familiar w these standards. We also find t

any of the specification writer's oncepts of painting no longer ap- ly. For example, specifications hich stipulate a coat of paint at coverage rate of 400 or 500 ft. er gal. have absolutely no mean- g in modern painting.

pecify dry film thickness

What should be required instead a specific minimum **dry film hickness.** Regardless of the num- er of coats, a finished film 1 mil hick is only one-third as good as he coat 3 mils thick.

This question of gauged coating hickness goes to the heart of the rrosion problem, inasmuch as any factors can influence the uantity of paint applied per uare foot. These include:

(1) Viscosity, which can be changed by adding thinner or altering the temperature of the paint.
(2) Whether stiff or flexible brushes are used.
(3) The amount of brushing out or extending.
(4) When spray painting, the amount of air pressure and material pressure used.
(5) Other factors known to the painter, but usually not to the inspector.

should be borne in mind that lay's coatings have increased hid- g power, which can be a decep- e factor.

One reason for the great spread painting bids is the fact that one ntractor will figure on applying int, while another will figure on plying one half paint and one lf cheap thinner. Yet each may conforming to the specifications they stipulate merely a certain mber of coats.

All this is changed when finished l thickness is specified and a ge is to be used to measure the ckness of the finished coating.

ecification suggestions

Paint specifications should:

1) Specify the paint material in accordance with a definite standard, such as a federal specification number or a Steel Structures Painting Council standard.
2) Specify the surface preparation in accordance with a definite standard.
3) Specify proper application procedure in accordance with a definite standard.

The type of coating should be sen on the basis of corrosion nomics. This means basing the ction of the coating system upon: (a) the square foot cost per year of protection, and (b) the cost of re-coating. It is inescapable that a considerable economic loss results whenever a dam and/or power- house must be shut down for re- painting. The initial cost of paint- ing may be insignificant in relation to the shut-down loss.

It may cost 60c per sq. ft. for a first rate penstock coating job which will last 20 years. The same penstock might be coated for, say, 10c per sq. ft., with the coating ex- pected to last about two years. In the first case, the square foot cost is 3c per year; in the second, 5c per year. When the inevitable shut- down comes it will multiply many times the cost for the short-term cheap coating job.

Meaning of "coating system"

Use of the term "coating system" may require some explanation. The term system is becoming more prominent in the vocabulary of painting. There are, for example, 4-coat or 6-coat vinyl systems, and each stage from preparation of the surface to finish coat is specific.

Systems vary for various coatings. In general, a painting system in- volves:

(1) A clearly defined and specific surface preparation as re- quired by the prime coat.
(2) Prime, intermediate and fin- ish coats that are formulated for use with each other.
(3) Application of the materials to provide the desired finish as determined by corrosion economics.

Much better painting, less confu- sion and fewer lawsuits will be the rewards if specification writers will avoid ambiguous terms such as "clean," "smooth," "sand," "wire- brush," "as directed" and "to the satisfaction of the engineer." They are quite meaningless terms and should be replaced with the pre- cise terminology of established work standards.

Improved bidding, performance

The specification improvements I have recommended would pro- vide the painting contractor with a sound basis upon which to esti- mate, bid and perform the work and would obviate risky decisions based on the opinion of field in- spectors.

Above all, the owner would re- ceive what he pays for—a consider- ation which should be paramount in the approach of every responsi- ble member of the hydroelectric (or any other) construction team.

NEW

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276 hp...20 yd heaped...37.7 m

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Easy-loading Fullpak® Scraper Design: Low angle loading, with wider entry for dirt. The fastest-loading scraper of all!

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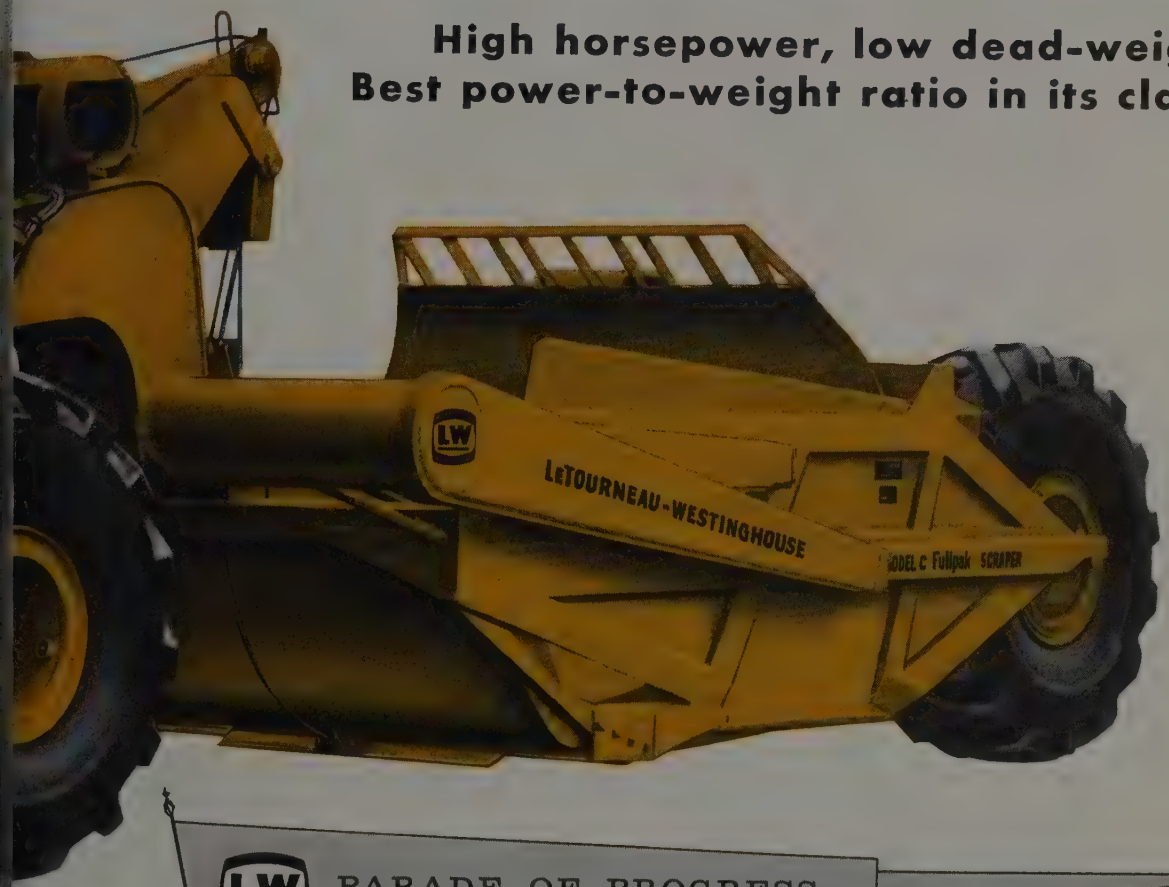

LW PARADE OF PROGRESS

This new V-power C Tournapull and the six-wheel Speedpull* announced on the previous pages are two more additions to an impressive array of new LeTourneau-Westinghouse earthmoving machines. They're part of LW's continuing program of product development to give you highest-production equipment at lowest ownership-operating cost.

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WESTERN CONSTRUCTION NEWS

Bur. of Rec. engineers are defended on outside activity

Congressional committee report criticizes department personnel for accepting work for private firms. Actions were known by superiors and principle approved.

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

THE U. S. DEPARTMENT OF JUSTICE has been asked to take any action it may deem proper — if it finds that there was anything illegal in the extra-curricular employment of some 214 Bureau of Reclamation engineers by private organizations.

That was the net of a lengthy discussion of charges brought during hearings of the House Subcommittee on Appropriations for the Bureau and other agencies of the Department of the Interior.

The charges — brought out in part during closed-door hearings— exploded in Washington early in June, when the full text of the committee hearings was made public. Specifically, the charge centered around Ireal Winter, chief of the bureau's hydraulic machinery branch at Denver. Mr. Winter, according to evidence presented to the committee by Rep. Ben F. Jensen (R., Iowa), had been employed by J. L. Savage, consulting engineer of Denver, to appear as a witness for one of Savage's clients (the City of Seattle) before the Federal Power Commission when the City bid for a power license for Ross Dam. Mr. Winter remained on the payroll of the bureau, despite his employment by Savage.

Disclosure of this matter by Jensen—along with the fact that permission for Mr. Winter to appear was granted, after disapproval in lower echelons, by former Reclamation Commissioner W. A. Dexheimer—brought a committee request for lists of all Bureau engineers who have done outside engineering work, while on Bureau payrolls.

Newly-appointed Commissioner Floyd E. Dominy produced a list of 214 employees of the Denver office who had done such outside work since 1945—some with written approval of their superiors, some with no written approval, but presumably "guided by departmental regulations" cautioning them against conflict of interests.

The lengthy committee discussion brought out the Bureau's viewpoint that most of the work in question had been done outside office hours, or or annual leave, and in only one instance seemed to be a direct violation of conflict-of-interest statutes. However, Dominy said that orders have now been issued to halt the practice, and that evidence gathered in the Bureau's own investigations of the matter has been turned over to the U. S. Attorney General for any action he may decide to take.

Specific case

Dominy, appearing before the committee in behalf of the Bureau's roughly $253,800,000 budget request, found himself involved in the controversy as soon as he had finished reading his prepared statement.

The action started when Rep. Jensen—having determined that the Bureau planned little or no employment increase this year — brought up legal provisions prohibiting government employees from accepting employment "in relation to any proceeding . . . in which the United States is a part . . . before any departmen agency . . ."

The Iowa congressman then r ferred directly to testimony befo an FPC examiner, in a matter co cerning Seattle's Skagit River deve opment. According to this recor Mr. Winter had been denied pe mission to appear as a witness o behalf of the City in a letter fro the Assistant Commissioner of Re lamation, dated Oct. 28, 1958. month later, in a letter from M Dexheimer, permission was gran ed. (Winter's testimony was inte rupted on objections of the Pen Oreille PUD, which complained Winter's "dual role".)

"It appears to me that both M Dexheimer and the City of Seatt representatives . . . may be guil of violation of . . . the Unite States Code," said Jensen.

In explaining Dexheimer's a tion, later testimony indicated th attorneys for Seattle had threaten to subpena Mr. Winter as a witne if the Bureau refused him perm sion to testify. Government leg counsel were said to have advis Mr. Dexheimer that it would better to permit Mr. Winter to t tify voluntarily. Accordingly, it w planned to place Mr. Winter annual leave, so that he would testifying "on his own time."

Defends employee

Dominy came strongly to the fense of Mr. Winter, with the sta ment that "he is a very valu man." He said further that Win has been officially reprimanded letter, and has been stopped fr taking any other outside empl ment, until the present matter been resolved.

"It was apparently comm knowledge," said Dominy, "in t Denver office that this outside w was being performed. His su riors took no steps to stop his p forming it."

"We have stopped all outsi work for grades above GS-11, a there is no further possible vio tion in progress at the moment. he (Mr. Winter) is in trouble, Bureau is at least a party to it,

cause it was known he was doing outside work, and steps were not taken to prevent . . . it."

In their probing, Congressmen, however, brought out another instance of employment of Bureau personnel by the Savage organization.

This one, "dismayed" Dominy, because the over-all plan — for the proposed $77,000,000 Nebraska mid-state project — was to be reviewed by the Bureau's Chief Engineer's office in Denver, in order that the Interior Secretary could make a recommendation on the feasibility of the project.

According to testimony, 27 Bureau engineering employees were employed by Savage directly, and 12 by the R. W. Beck Co.—a consultant to the Nebraska Mid-State organization, which also sub-contracted some of its engineering work to Savage.

Reasons

Commenting on the general situation, Mr. Dominy ascribed the prevalence of outside work (which would thus seem to involve about half of the roughly 500-man engineering force at Denver) to a shortage of competent engineers in the field of hydraulics.

"As a matter of fact," he told congressmen, "in this technical engineering field, there are so few people qualified that even the professional engineering societies have not frowned on outside employment of our staff experts.

"The Bureau of Reclamation, over the years, has accumulated within the framework of its organization the best group of engineers in the field of reclamation, large dams, hydroelectric and related endeavors, of any organization in the world. The Denver office of the Bureau is besieged . . . with requests from all over the world to perform technical work.

"In addition to that, private consulting firms . . . frequently come to the Bureau seeking employees to do some technical work on their own time, because we have the source of the greatest supply of technical knowledge and experience available in this field.

"We have known that our employees were engaged in outside activities in the engineering field, working for various consultants. That has been a common practice . . . as long as it is done without interfering with the employment during their regular working hours."

LETTER — Rubberized asphalt

AN ARTICLE on "Rubberized Asphalt for Seal Coats" which appeared in the April issue of *Western Construction* was based on a report prepared by the Natural Rubber Bureau, and obtained through the cooperation of the Colorado Department of Highways. Jewell Benson, consulting bituminous engineer, was a technical observer at these extensive field tests and has sent these added comments on the tests and the results.

Editor:

The article "Rubberized Asphalt for Seal Coats", published in the April issue of *Western Construction,* failed to cover several items which may be of interest to your readers.

The Colorado Highway Department began use of rubberized asphalts for surface treatments in September, 1954, with installations at Rifle and near Alamosa. The success of these projects (determined after two years of observation) led to extensive use of rubberized asphalts for this purpose by that department. Bids were taken by the department for 175,000 gal. of rubberized asphalt early this year, to be used for maintenance sealing and surface treatment work.

Initial work in Colorado and through 1957 was primarily with asphalt rubberized with 3% butadiene-stryene type 2006 polymer, this material giving excellent results. However, in 1958, several cars of asphalt (in RC-3 and RC-4 grade) were used, rubberized with Neoprene type 635 latex, using 1½% rubber in the base asphalt. The handling and behavior of the Neoprene rubberized asphalt has led the department to almost exclusive use of this type of rubber this season, with only one car of butadiene-styrene rubber to be used.

It is the opinion of the engineers associated with the work that the Neoprene rubberized asphalts develop high degrees of aggregate holding-power more quickly than the butadiene-styrene rubberized materials, although the latter are many times more superior to untreated asphalts. Almost complete absence of bleeding are characteristics of both rubberized asphalts.

The purpose of the experimental project at Walsenburg, Colo., was to determine the relative behavior of the butadiene-styrene and Neoprene rubberized asphalts, compared to asphalt rubberized with natural rubber, and to untreated asphalt. The natural rubber RC-3 was the first to be made by the Benson Process, and an unexpected gelling reaction occurred during application, giving high viscosities and a poor application in two of the three test sections allotted to each asphaltic material. (Cause of the gelling was determined and should natural rubber be used in the future, no difficulty from this source is expected).

In this test, the same application temperatures (except in the gelled natural rubber), application rates and application rates of aggregate were followed for all materials. Within a few days after construction, all control sections, using a straight RC-3, had darkened perceptibly, while all rubberized sections remained free from darkening, bleeding or excessive loss of aggregate. Today, nine months after construction, these differences in appearance remain.

With the behavior of the various asphaltic materials determined for the initial nine-months period, the project is now of special interest in long-time behavior, extending over a period of years. It is hoped that significant differences in behavior of the different rubber materials will develop, permitting a better evaluation of the type of rubber to be used in future work. The butadiene-styrene rubber has established an excellent reputation over a period of more than five years and Neoprene over a period of more than two years. Although natural rubber has been used over a period of many years, the behavior of the material produced at Walsenburg remains to be determined. Immediate behavior with the exception of the gelling reaction, was very good—the long time behavior must yet be determined.

The rubberized asphalts were also produced by Husky Hi-Power, Inc. at Cody, Wyo. This is presently the only source of Benson Process rubberized asphalts in the U. S., and material is being shipped from Cody to the east coast, Florida, Washington and Oregon. It is hoped that other sources will soon be available in other areas of the country, permitting a wider use of these materials.

Jewell R. Benson
Consulting Bituminous Engineer
Denver, Colorado

NEW CAT DW20 SERIES G TRACTORS FASTER HAULING AND EASIER LOADING"

Bryan Carl, Partner, Dean Word Co., New Braunfels, Texas

That's the substance of the many field reports coming in from contractors everywhere! The new DW20s, matched with new No. 482 Series B Scrapers, are paying off with faster cycles, greater production and more profits!

Here you see one of two new DW20s hauling on a section of Interstate Highway near New Braunfels, Texas. With a D9 pushing, average loading time is 30 seconds. Partner Bryan Carl of Dean Word Co. says: "Our new DW20 Series G Tractors are faster hauling and easier loading. Caterpillar-built equipment has longer life with less down time—it stays on the job better. We get excellent service from our Caterpillar Dealer."

Look at the ratings on the new DW20-No. 482. To handle the increases in horsepower, rimpull and scraper ratings, both tractor and scraper have been improved in design and structure. The tractor, for example, has stronger final drives and improved transmission forks. The scraper has a stronger bowl, push frame, draft frame and apron. Result: better service life, less maintenance and cheaper dirt.

Here's a four-wheel rig that meets your needs for higher, more economical production on today's big jobs. Ask your Caterpillar Dealer for complete facts about it. See for yourself how the new DW20-No. 482 can step up your production!

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

NEW DW20-No. 482

	SERIES G	SERIES B
NEW HP	—345 (maximum output)—increased 8%	
NEW RIMPULL	—39,565 lb. (maximum)—increased 12%	
NEW SPEEDS	—increased rimpull provides up to 20% faster travel speeds under similar haul road conditions	
NEW CAPACITY	—24 cu. yd. (struck) 34 cu. yd. (heaped)	

Corresponding increases have been made in the new two-wheel DW21 Series G Tractor.

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HAUL AT LOWEST COST PER CU. YD.

Tacoma to go ahead with building of Mayfield Dam

IMMEDIATE completion of the Mayfield Dam on the Cowlitz River has been approved by the Utility Board of Tacoma. Action of the board follows the reports submitted by the consulting firm of Ford, Bacon & Davis. At the same time the board concurred with the consultant in asking permission of the Federal Power Commission to delay the building of the Mossyrock Dam for several years. The present license from the FPC provides for the building of the two dams at the same time, but legal delays have made this physically impossible. Further, the storage provided by Mossyrock will not be required at this time.

Legal hurdles have not been completely overcome, with another attempt being made by organized sportsmen of Washington to prevent the damming of the Cowlitz River in the interests of sports fishing. This is not considered a serious threat to the continuation of work on Mayfield Dam.

Present cost estimate for the project is $40,000,000, which includes three generators in the powerhouse that will be designed for the addition of a fourth unit. This cost figure includes about $10,000,000 which have been spent to date on the dam.

Colorado canal contract awarded

A $1,598,349 Bureau of Reclamation contract for construction of the 15.2-mi. first section of the Southside Canal of the Collbran Project in west-central Colorado has been authorized for award. The job goes to the Refinery Engineering Co. Division, Vitro Corporation of America, Farmington, New Mexico, on that firm's low bid. Ten bids were received for the job.

The work to be undertaken includes construction of approximately 15.2 mi. of unlined and earth-lined canal, several concrete structures along the canal, and approximately 1.3 mi. of siphons. The canal, which will have bottom widths varying from 10 to 16 ft., extends from Vega Dam to Cottonwood Creek, southwest of Collbran, at an average elevation of about 7,500 ft. above sea level. Contract for a 2,300-ft. tunnel in the middle of the canal was awarded last November.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Fairbanks

POWER STUDY — Alaskans have hopes that the new state will move ahead industrially. However, the one big stumbling block to industrial growth at this time is the fact that large blocks of cheap power are not available. Alaskans want more power dams to provide electrical energy at rates that will be attractive to new industry. The first step in expansion of present power capacity may well be the visit to Alaska in June of six government officials who are conducting a reconnaissance survey of power facilities in the Anchorage and Fairbanks area. The study is being conducted by the technical interagency power group looking toward the possibility and feasibility of integrating military power generating facilities with those of civilian systems. Such integration, along with new generating capacity, could provide a strong incentive to new industry interested in taking root in the 49th state.

CONSTRUCTION CLOUD — As this is written, an ominous cloud is hanging over the Alaska construction scene. A year which most Alaskans expected would be a record-breaking construction effort is shadowed by labor unrest. Fairbanks plumbers and contractors are deadlocked over the issue of hiring policies, principally, although a wage dispute also is at issue. The alarm felt by Alaskans at the implications of this walkout—the possibility it may spread to other crafts—was mirrored by a Fairbanks News-Miner editorial which stated, in part: "There is a third party to this dispute more important, actually, than either the plumbers or contractors. He is John Q. Public. Nobody will deny that the paralyzing influence of a strike has a lamentable way of spreading to other crafts and bringing to a halt jobs as unrelated to plumbing as a pickaxe is to a kangaroo."

DON'T COME NEAR THE WATER—Union men in the Kodiak area are using some pretty salty language in describing charges that the seagoing so-and-so's are snatching away their bread and butter. The charge that Navy Seabees are doing work in Kodiak and Adak which should be done by civilian labor was forwarded by the Kodiak men to Henry Hedberg legislative represenative for the Alaska State Federation of Labor Hedberg, in turn, relayed the charges to Alaska's Sen. E. L. (Bob Bartlett in the nation's capital Hedberg told Bartlett that Seabees in Kodiak and Adak were doing painting, electrical work, plumbing, roofing, building repairs, road work and taxiway seal coating. "I feel much of this work is outside the scope of training and that there are contractors and sub-contractors now doing work in these areas, who would be glad to bid this work," Bartlett was told. Hedberg told Richard Gray, president of the Building and Construction Trades Department of AFL-CIO to assist in the campaign to convert the Kodiak and Adak jobs from military to civilian auspices. So far, there has been no statement on the matter from Alaska Navy headquarters at Kodiak.

SCHOOL CONSTRUCTION—An important phase of the Alaska construction effort—at least so far as the "bush country" of the North is concerned is the $2,000,000 school construction program planned for this summer by the Bureau of Indian Affairs. According to plans announced by James E. Hawkins director of this Federal agency in Alaska, a new high school will be built at Unalakleet on Norton Sound. Other schools are planned for smaller villages, including Noorvik and Alakanuk. New classrooms are planned at Kwethluk Napaskiak, Hooper Bay and New Stuyahok.

BIG PORT JOB — Gerald S. Rinehart, well-known in the construction industry, has arrived in Anchorage to take over as project engineer for the new $8,000,000 Anchorage port, now under construction. He will be with Tippetts Abbett, McCarthy and Stratton the port engineering firm for which he has worked on other jobs during the past eight years. From 1949 to 1957, he was project manager and chief engineer in charge of design and construction of a $40,000,000 highway between Cochabamba and Santa Cruz in Bolivia South America. Rinehart replaces

George Matkin, who resigned to accept a position with Doughty Construction Co.

NEW UNIVERSITY — The cornerstone of the first building of the Alaska Methodist University will be laid at a special ceremony in Anchorage on July 12. The ceremony will mark the beginning of a construction program that ultimately will cost more than $10,000,000. Start of construction on the university will be the occasion for the visit to Alaska of a number of leaders in the Methodist Church—and the formal cornerstone-laying is scheduled to be a major Alaskan event.

END OF AN ERA — The "public works" era in Alaska appears to have reached an end—particularly insofar as the Interior Department is concerned. The Alaska Public Works program expired on June 30, bringing to an end a decade during which funds for 172 projects—most of them municipal-type jobs—were allocated. A $70,000,000 public works fund provided the major share of money needed for the projects throughout Alaska. APW has been discontinued, according to Sen. E. L. (Bob) Bartlett, because both the Budget Bureau and the Interior Department have concluded they could not support its continuation. This conclusion was based on the fact that the Interior Department no longer has the authority for local activities within the new state of Alaska.

JET AGE JOB—Preliminary work has begun on extending the Anchorage and Fairbanks international airports to bring them within the requirements for jet plane landings and takeoffs. The Fairbanks airstrip, for example, will be extended to 11,500 feet from the present 6,000 feet. In Alaska, with problems of permafrost and terrain, the extension of a modern runway a few thousand feet is a construction project of the first magnitude. Extension of the two major runways—those in Anchorage and Fairbanks—will cost more than $8,000,000. Funds for design, engineering and actual construction will be provided through the Alaska Omnibus Bill—a transitional measure designed to give Alaska a fiscal boost during the crucial early years as a new state.

NUGGETS — Ketchikan's employment situation is the best it has been since 1951. An addition to the Ketchikan Post Office is authorized at an estimated cost of $200,000. Estimated cost of paving in various parts of the city will be $400,000. . . The Coast Guard plans to erect a building on Annette Island in southeastern Alaska at a cost of $700,000. . . An Anchorage group is attempting to raise $350,000 for construction of a sports arena. . . Plans for a $1,500,000 shopping center have been announced in Fairbanks, where two other shopping centers already are under construction. . . Workers excavating a building site in Anchorage turned up an underground bootleg establishment dating from prohibition. Excavators reported the jugs in the abandoned hangout were empty. . . A post office was established at the Clear construction site on June 15; it's a branch of the Fairbanks post office. . . At least two large concerns are studying the possibility of constructing a new hotel in Fairbanks. . . The University of Alaska has a contract for special research in connection with proposed atomic blasting of a harbor at Cape Thompson on the Arctic Coast.

HAWAII Report

By ALAN GOODFADER, Honolulu

DOING ITS BIT – Hawaii's last Territorial Legislature has adjourned after, among other things, doing its bit to keep Hawaii's construction boom headed toward the stratosphere. A bill awaiting Governor William Quinn's signature provides spending of $39,000,000 for capital improvements for the Territory and its four counties during the next two years. The bill includes $9,155,299 in improvements to be paid for in cold cash. These include $4,886,250 in Territorial projects and $4,269,049 in Territorially paid county projects. Another $20,971,625 worth of Territorial projects and $9,038,375 in county projects to be financed by borrowing. Quinn has an item veto power, but as a candidate for the post of Hawaii's first state governor he is expected to approve the vast majority of the projects. They range from a $1,000,000 high school down to a $4,800 electric panel board for the Hawaii Judiciary Building. Included are structures, roads, parks, schools and shore and harbor work, as well as a $77,000 memorial at the sunken battleship Arizona, left on the bottom of Pearl Harbor as a memory of World War II.

IT JUST KEEPS ROLLING – Even without such massive transfusions, the construction trade is tooting along at top speed here. The Bank of Hawaii credits construction with a major part in helping business on Oahu to reach the highest second quarter levels in history. Barring a shipping strike, construction will continue at capacity levels through the second and third quarters of 1959, the bank predicts.

THE BIG PUSH—All this activity was in spite of a first-of-the-year dip in construction starts which now appears at an end. Construction starts in April totaled more than $25,200,000. This included $18,600,000 in federal and local government and military spending. Honolulu building permits, the index of civilian building here, represented a value of nearly $9,700,000 in April, or $1,200,000 more than in the same month of 1958—a record construction year in the Islands. The April total brought that of the first four months to $33,100,000 compared to $32,800,000 a year ago.

LOVE THOSE TOURISTS – Hawaii's burgeoning tourist industry is accounting for much of the construction industry's rosy outlook. Pacific Construction Co. has been awarded a $336,000 contract to build a six-story wing at the Waikikian Hotel. Another $164,000 will go for site improvement, landscaping and furnishings. This is just the latest addition to plans for hotel expansion which are expected to unfold as the season grows and jet planes begin whooshing their way to Hawaii. And the air lines are complaining that hotel owners aren't putting 'em up fast enough.

RICH RELATION – Related to the hotel expansion is the crazy-quilt of cooperative apartment buildings springing up in Waikiki. Rich tourists as well as rich Hawaii residents and firms that send their executives here are buying in like mad. Construction is about ready to start at this writing on $4,500,000 worth of co-ops within a one block area of Waikiki. These include a $3,000,000 building, a $1,000,000 10-story building and a $500,000 10-story building. And a local development firm is seeking financing for a $10,000,000 25-story hotel-apartment building in the same area.

AND THAT AIN'T ALL – Commercial and industrial construction also is adding its bit to Honolulu's sky-line. E. E. Black, Ltd., offered a $941,150 low bid on a five-story head office building for a local insurance firm. The building will include a unique aluminum sun screen to protect two sides of the building from the sun. It will be constructed several feet from the sides of the concrete-steel building to provide vision and light. Catwalks from walls to screen will allow maintenance. The structure will have 54,000 square feet of floor space and can be expanded.

WAREHOUSE PLANNED – Warehousing, a crying need here, will be expanded by the construc-

tion soon of a $500,000 buildi
with 2½ acres of covered space,
has been announced. This is t
first large structure planned recen
ly in a type of construction th
may mushroom here to meet t
needs of Honolulu's busy harbo
which is undergoing expansion i
self.

BIG BITE—Even Hawaii's resta
rant trade is doing its bit. K. & M
Sakamoto is the contractor on t
first phase of a $250,000 enlarg
ment of Fisherman's Wharf, one
Honolulu's tourist restaurants. M
jor building job in the enlargeme
is addition of a second story to t
present building.

SCHOOL CONSTRUCTION
After spending more than a mi
lion dollars a month on school co
struction last year, Honolulu is pr
paring to step up the pace. Th
federal government has promise
help by authorizing $1,797,432 i
federal funds for school constru
tion. This is the first payment
grants totaling $2,810,000 the loc
schools will receive during fisc
1959 to help build classrooms f
the children of military famili
and federal employees in America
bastion of the Pacific.

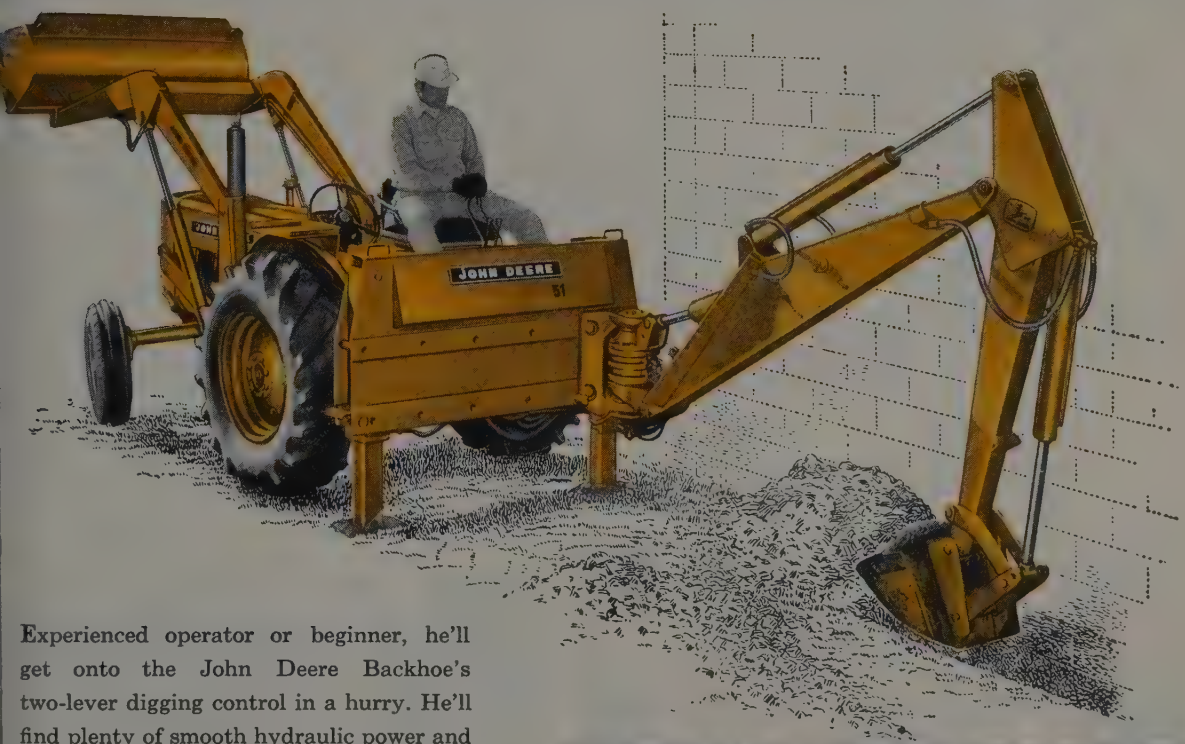
HIGHER EDUCATION – Th
University of Hawaii, too, is com
peting for the services of the Ter
tory's builders. It is to open bi
soon after this writing on a $55
000 three-story physical educatio
building with sun control louve
of aluminum that will be co
trolled automatically.

Steel contract awarded on $15,000,000 building

CONTRACT for more than $
000,000 has been awarded Bethl
hem Steel Co. by Tishman Real
& Construction Co., for its 22-sto
office building at Wilshire a
Flower in Los Angeles. Excavati
on the site of the $15,000,000 pr
ect has started. Much of the 3,0
tons of structural shapes, to be fa
ricated by Bethlehem at Torran
will be shipped West by rail
stead of boat to expedite constr
tion, scheduled for completion ne
spring.

The building, at 285 ft., will
the tallest in Los Angeles exc
for the 25-story City Hall. To
faced in Italian blue glass mos
tile, vertically divided by extrud
aluminum fins, the Tishman off
building will have 335,000 squa
feet of rentable area.

Your Operator Takes on New Skill with This Easy-to-Manage JOHN DEERE BACKHOE-LOADER



Experienced operator or beginner, he'll get onto the John Deere Backhoe's two-lever digging control in a hurry. He'll find plenty of smooth hydraulic power and break-out pressure behind those levers, too —and with the low mounting of the boom's rotary cylinder, he'll get the best possible view of his work.

If it's a job of flush digging, your operator can set the rotary cylinder left or right in a matter of minutes, using only a wrench and the unit's hydraulic power.

Backfilling and loading are fast, too, with the "440's" optional clutch-type manual direction reverser and power steering.

For detailed specifications, and price information see your John Deere Industrial Dealer.

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JOHN DEERE "Specialists in Low-Cost Power with a Heavyweight Punch"

. . . for more details, circle No. 31 on Reader Service Postcard

Low bids and contract awards

ALASKA

The joint venture of **Morrison-Knudsen** and **Patti-MacDonald Construction Co.** received a $3,595,049 contract for construction of 3 technical buildings for the U. S. Air Force at Clear, Alaska. Project also includes passageways with required excavation and backfill. **Lease Co., Inc.** of Anchorage and Seattle received a $597,862 contract for construction of additional Army aviation facilities at Fort Richardson. Work includes a shop addition to the hangar building, unit operations and administration building, parking area and related work. A $264,800 contract was received by **Paul W. Speer, Inc.** of Los Angeles, Calif. for construction of a jet engine test cell for the U. S. Air Force at Elmendorf Air Force Base. **J. A. Troxell** of Seattle, Wash., received a $122,910 contract for dredging the Neva Strait in southeastern Alaska.

ARIZONA

Martin Construction Co. of Tucson submitted a low bid of $2,479,119 for grading, surfacing and two interchange structures on the Tucson-Benson highway, U. S. Rte. 80 and 83 in Pima County. A low bid of $1,898,517 was submitted by **Copper State Construction Co.**, Mesa, for 5.3 mi. of grading, surfacing and 2 interchange structures on the Cordes Junction-Flagstaff highway north of McGuireville in Yavapai County. **Isbell Construction Co.**, Phoenix, submitted a low bid of $1,690,233 for 8.9 mi. of grading ,surfacing and construction of 2 overpasses on the Holbrook-Lupton highway in Apache County. A low bid of $1,245,845 was submitted by **Vinson Construction Co.** of Phoenix for grading, surfacing and 1 interchange structure and 2 concrete slab bridges in Yavapai County. **The Ashton Co., Inc.** of Tucson submitted a low bid of $1,127,744 for grading, surfacing and 2 concrete bridges on the Benson-Steins Pass highway in Cochise County. **N. P. Van Valkenburgh Co.** of Phoenix submitted a low bid of $995,261 for grading, surfacing and construction of storm drain on the Phoenix Interstate Freeway, Phoenix, Maricop County. A low bid of $444,17 was submitted by **Southern Arizon Construction Co.**, Tucson, for 6. mi. of grading, surfacing and r lated work on the Picacho-Floren Jct. highway in Pinal County. **Sta Owens Construction Co.** of Ho brook submitted a low bid of $411 560 for grading and surfacing fro Alpine, southerly to near Camp bell-Blue Creek crossing in th Apache National Forest in Gree lee and Apache counties. **Tanne Bros. Co., Inc.** of Phoenix sub mitted a low bid of $378,470 fo grading various sections in city o Flagstaff, Coconino County. **T. M K. Construction Co.**, Phoenix, sub mitted a low bid of $255,084 for mi. of grading and surfacing on th Gila Bend-Ajo highway in Mar copa County. **Givens Constructio Co.** of Phoenix submitted a low bi of $182,207 for grading, surfacin one underpass structure and relate work on the Phoenix Interstat Freeway in city of Phoenix. **W. H Skousen Construction Co.** of Mes submitted a low bid of $162,80 for grading, surfacing and wide ing the Kingman-Ashford highwa northeast of Kingman in Mojav and Coconino counties. **Cyr**

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Telephone: CYpress 3-7656

Fresno Friction Materials
2546 Ventura St., Fresno 1, Calif.
Telephone: AMherst 6-0871

Valley Friction Materials
1817 Sherman Way, No. Hollywood, Calif.
Telephone: POplar 5-5174

Friction Materials Company
95 S. Santa Fe Ave., Los Angeles 21, Calif.
Telephone: MAdison 7-9926

Power Unit Corp.
2904 N. Durfee Rd., El Monte, Calif.
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Compton Friction Materials Company
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Telephone: BElmont 5-2566

... for more details, circle No. 33 on Reader Service Postcard

Evans Contracting Co. of Tempe submitted a low bid of $146,675 for grading, surfacing and related work on 9.4 mi. of the Duncan-Alpine highway between Clifton and Alpine on U. S. Rte. 666 in Greenlee County. **Kenneth A. Ethridge Construction Co., Inc.** of Tucson submitted a low bid of $118,744 for grading and surfacing on the Superior-Winkelman highway northwest of Winkelman on Route 177 in Gila County.

CALIFORNIA

Guy F. Atkinson Co. of South San Francisco received a $1,895,777 contract for repaving two lanes on U. S. 99 north of Grapevine Station. The contract also covers traffic separation bridges and additional lanes to tie in with freeway under construction on Grapevine Grade, in Kern County. A $1,143,863 contract was received by **McGuire & Hester** of Oakland for grading and surfacing 1.7 mi. in city of Modesto, Stanislaus County. **Gordon H. Ball and Gordon H. Ball, Inc.** of Danville received a $1,010,234 award to construct 5.2 mi. of 2-lane highway near Winters, Solano County. **Erickson, Phillips & Weisberg-Arthur B. Siri, Inc.** of Concord received a $984,227 contract for construction of a bridge over the Eel River, U. S. 101 south of Scotia in Humboldt County. **Griffith Co.** of Los Angeles received a $522,041 contract for 10.3 mi. of grading and surfacing, west city limits, city of Los Angeles, Ventura and Los Angeles counties. A $490,740 contract was received by **A. Teichert & Son, Inc.** of Sacramento for grading, surfacing and related work in and north of Chico in Butte County. **E. L. Yeager Co.**, Riverside, received a $381,979 contract for widening and surfacing three sections on U. S. 99/66 and U. S. 466 east of Kramer in San Bernardino County. **I. L. Croft & Son, Inc.**, Saugus, received a $332,968 contract for grading, surfacing and related work of U. S. 395, south of Bridgeport and Route 108, in Mono County. **Osborn Co.**, Pasadena, received a $274,087 contract to widen 2 mi. of Foothill Blvd. in city and county of Los Angeles. A $248,364 contract was received by **Healy Construction Co.** of Palmdale for grading and surfacing sections on U. S. 101 in Santa Barbara County and in Paso Robles; sections of Route 1, near Vandenberg Air Force Base and U. S. 466 at Morro Bay in San Luis Obispo County. **Fredrickson & Watson Construction Co.**, Oakland, submitted a low bid of $237,777 for 1 bridge across Sisquoc River east of Santa Maria in Santa Barbara County. **R. E. Hazard Contracting Co.**, San Diego, submitted a low bid of $227,981 for constructing approaches to the U. S. Customs inspection area at the Mexican border in San Diego County. **Lord & Bishop, Inc.** of Sacramento received a $171,544 contract for constructing bridge over the San Joaquin River at Patterson in Stanislaus County. **Ralph B. Ellis**, North Hollywood, received a $168,496 contract for resurfacing on different sections of highway in Kern and Kings counties. **Sully-Miller Contracting Co.**, Long Beach, received a $156,289 contract to widen to 6 lanes on 1.2 mi. of Valley Blvd. in and near El Monte, Los Angeles County. A $336,021 contract was received by **Baun Construction Co. Inc.** of Fresno to widen a 2-lane highway on Route 29 near Kelseyville in Lake County. **Stanton Biggs**, Fresno, received a $197,67 contract for resurfacing, replacing retaining walls and surfacing on sections of Route 1 between the San Luis Obispo County line and north of Big Sur in Monterey County. **Lester L. Rice & Sons** Yuba City, received a $176,696 contract for widening the Wadsworth Canal Bridge on Route 20 west of Yuba City in Sutter County. **Clements Construction Co.**, Fremont submitted a low bid of $168,90 for grading and surfacing north of Tahoe Valley in El Dorado and Placer counties. A $416,966 contract was received by **Donna Construction Co.**, San Luis Obispo, for widening to 4 lanes on 8.5 mi. of U. S. 101, north city limits of Ventura in Ventura County. **Carey Bros.** of San Anselmo received a $404,064 contract to widen, grade and surface 2.1 mi. on Route 88 east of the Alpine County line in Amador and Alpine counties.

COLORADO

Davis & Butler Construction Co of Salt Lake City, Utah, submitted a low bid of $1,669,358 for earth work, pipe, and structures for Bonham and Cottonwood pipe line Collbran Project. **C. L. Hubner Co.**, Denver, submitted a low bid of $340,293 for grading, structure and surfacing on 2.1 mi. on Fort Collins-south in Larimer County A low bid of $187,361 was submitted by **Harrison Construction Co.** of Denver for 4 mi. of grading surfacing and structures, Nichola

Special report to Caterpillar D8 Tractor owners:

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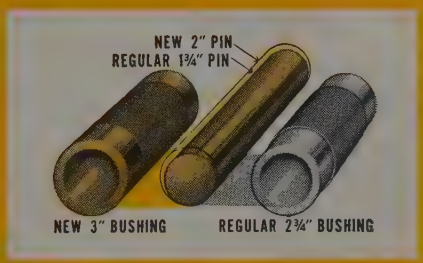
NEW TRACK COMPONENTS AVAILABLE FOR MOST D8 TRACTORS... GIVE UP TO 44% LONGER LIFE

Caterpillar's continuous research and testing pay off for you with the development of superior D8 track components. The next time you replace track parts, specify these new components. They last longer and require less maintenance. Here's what's available for 2U, 13A, 14A and 15A tractors:

30% STRONGER PINS AND BUSHINGS have more wear area to extend life. The big track pins are ¼" larger in diameter and heat-treated deep to resist wear . . . pins will not bend and cause uneven wear. The large contact areas of the bushings are hardened deep, both inside and out. Under field conditions these bushings have lasted up to 44% longer than regular bushings.



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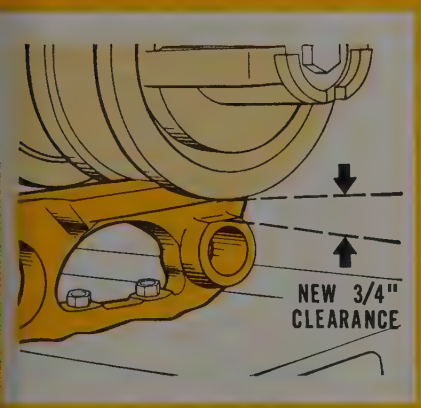

STRONGER, LONGER, HIGHER TRACK LINKS are 3 lb. heavier, 1" longer and ¼" higher. New length means fewer track sections are required. Increased height gives up to ¼" more *link pin boss-roller flange* clearance. Improved steel used in these links permits 80% deeper rail hardening and greater strength—pins and bushings stay tight *in the links* even under the roughest application.

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NEW DESIGN BORALLOY SPROCKET REPLACEMENT RIMS are available to accommodate the increased pitch of the longer links and bigger track bushings. Teeth are precision-machined to provide exact fit with track bushings—a major contribution to longer bushing life.

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Wash-north highway in San Miguel County. **L. H. Kilgroe Construction Co.** of Lakewood submitted a low bid of $1,658,758 for grading, structures and paving 3 mi. of the Pikeview-Colorado Springs highway in El Paso County. A low bid of $152,042 was submitted by **John W. Brown Co.** of Denver for grading, surfacing and bridge construction near Cozy Corner in Adams County. **J. A. Park Machinery Co., Inc.,** Pueblo, submitted a low bid of $148,100 for 2.3 mi. of highway lighting and signing, North Pueblo, Pueblo County. **J. P. Elliott,** Pueblo, submitted a low bid of $137,170 for 1.2 mi. of grading and surfacing MC Elmo Canyon road in Montezuma County.

IDAHO

Malan Construction Corp., New York, N. Y., submitted a low bid of $3,440,000 for construction of additional facilities at the Experimental Breeder Reactor No. 2 project near Idaho Falls. **Stearns-Roger Mfg. Co.,** Denver, Colo., submitted a low bid of $439,559 to construct exhaust duct and stack system for the Flight Engine Test Facility at the National Reactor Testing Station. **R. E. Rice,** Boise, submitted a low bid of $1,819,417 to construct Idaho State Highway Building in Boise. **Robert V. Burggraf Co.,** Idaho Falls, submitted a low bid of $231,690 for constructing a bypass road near the Aircraft Nuclear Propulsion Area and to grade and surface miscellaneous other roads and areas at the National Reactor Testing Station.

MONTANA

Nilson-Smith Construction Co. of Great Falls received a $762,810 contract for grading and surfacing on 19.8 mi. on the Grassrange-Malta road in Fergus and Phillips counties. A $605,418 contract was received by **Kiely Construction Co.,** Butte, for grading, surfacing and seal coating 16.7 mi. of the St. Ignatius-Pablo road, Arlee-Ravalli road, Ravalli-West road in Lake County. **W. P. Roscoe Co.,** Billings, received a $298,813 contract for bridge construction on the Tampico-Glasgow road in Valley County. **Richardson Construction Co.** of Miles City submitted a low bid of $155,420 for 10 mi. of grading and surfacing on the **Glendive-Richey** road near Bloomfield in Dawson County. **Albert Lalonde Co.** of Sidney submitted a low bid of $130,143 for grading and surfacing 9 mi. on the Circle-Sidney road in Dawson County.

NEVADA

Isbell Construction Co. of Reno submitted a low bid of $652,324 for 8.5 mi. of grading and surfacing on U. S. 93 in Elko County, and received two contracts for work in Washoe and Lyon counties: a $411,856 contract for 6.5 mi. of grading and surfacing on State Route 33 in Washoe County, and $267,957 for 3.3 mi. of grading and surfacing east of Smith in Lyon County. **Wells-Cargo, Inc.,** Las Vegas, received a $599,803 contract for construction of a portion of the State Highway System on U. S. 93 in Elko County. **General Contractors Co.,** Las Vegas, received a $341,173 contract for grading and surfacing 13.3 mi. of U. S. 93 in Lincoln County.

NEW MEXICO

J. W. Jones Construction Co., Albuquerque, submitted a low bid of $985,767 for grading and surfacing from Jct. U. S. 70 northerly in Dona Ana County. **Jack Adams** of Santa Fe submitted a low bid of $345,617 for 5.3 mi. of grading and surfacing in Taos County. A low bid of $309,221 was submitted by **Wylie Bros. Co.** of Albuquerque for 6.4 mi. of grading and surfacing in Grant County. **Henry Thygesen & Co.** of Albuquerque submitted two low bids for roadwork in Taos and Otero counties: $335,370 for grading and surfacing on 10.2 mi. near Arroyo Hondo in Taos County, and $275,286 for 17.9 mi. of grading and surfacing on the Cloudcroft-Mayhill road in Otero County. **Burn Construction Co., Inc.,** Las Cruces, submitted a low bid of $186,370 for 2.4 mi. of grading and surfacing in Dona Ana County.

OREGON

Merritt-Chapman & Scott Corp., New York, N. Y., submitted a low bid of $23,985,564 for construction of Cougar Dam on the South Fork McKenzie River. **R. A. Heintz Construction Co.** of Portland submitted a low bid of $1,852,309 for 4.1 mi. of grading and surfacing the McKenzie River-Willamette River section on the Pacific Highway in Lane County. A low bid of $1,718,220 was submitted by **Roy L. Houck Sons Corp.,** Salem, for 12.5 mi. of paving the Halsey Int change-Lane County Line secti of the relocated Pacific Highwa east of Halsey and Harrisburg Linn County. **C. R. O'Neil, Cr** well, submitted two low bids f work in Umatilla County: $588,3 for 5 mi. of grading and surfaci the North Unit, Weston-Milto Freewater section of the Orego Washington highway, and $381,3 for the East Unit, Weston-West Mt. section of Weston-Elgin hig way, east of Weston. A low bid $900,793 was submitted by **Roge Construction Co.,** Portland, for 7 mi. of grading and surfacing t Glover-Perry section of the O Oregon Trail Highway, southea of Kamela in Union County. low bid of $800,267 was submitt by **Peter Kiewit Sons' Co.,** Omah Nebr. for construction of Washin ton County Line-Highlands Int change section of Sunset Highwa west of Portland in Multnoma County. **Clarence Braden Co struction Co.,** Walla Walla, Was submitted a low bid of $543,339 f 6.7 mi. of grading and surfaci and 2 structures on the Wasco-H Canyon section of the Wasco-Hep ner highway in Sherman Count **Miller & Hutchins Contractors, In** of Roseburg submitted a low b of $529,912 for 1.8 mi. of gradi and paving on the Corvallis secti of the relocated Corvallis-Newpo highway, southwest of Corvallis Benton County. **General Constru tion Co.,** Seattle, Wash. submitt a low bid of $295,840 for Interst Bridge Toll facilities on the Paci Highway in Multnomah Count **M. J. Brassfield Co., G. E. Blaisd & Sons Co. and S. G. Stone Co.** Salem submitted a low bid of $37 516 for grading and paving secti of the Boones Ferry Road-Oswe highway in Clackamas County. low bid of $118,365 was submitt by **Charles T. Parker Constructi Co.,** Portland, for grading a paving in Oregon City, Clackam County. **Utility Construction C** Ontario, received a $184,874 co tract for construction of riprapp gravel levees along both banks Salmon Creek at Oakridge.

UTAH

W. W. Clyde & Co. of Spri ville submitted two low bids roadwork in Summit and Gra counties: $1,947,659 for gradi and surfacing and 1 structure the Wasatch-Castle Rock road

(Continued on page 82)

MASSEY-FERGUSON 406

offers the BIG CHANGE *in tractor shovels*

visibility unlimited–maneuverability unexcelled

A fresh, new approach — the BIG CHANGE in tractor shovels — the Massey-Ferguson 406. All-new design combines the features you asked for — better maneuverability, greater visibility, high-class performance — and at a competitive price. The 406's speed and maneuverability combined with its 1 cu. yd. payload make it possible to out perform larger, more expensive machines as well as handle the precision, utility jobs efficiently and economically. Here's why:

Exclusive Massey-Ferguson "Instant Reverse" with torque converter has forward and reverse acceleration pedals — allows you to change direction instantly and smoothly with a mere touch of your toe — no shifting, no clutching, no levers to pull, five equal speeds in either direction.

Advanced Design puts the operator where he belongs — centrally located so he can see forward as well as to the rear and both sides.

Responsive Power — 60.3-h. p. engine; 5,000-lbs. breakout.

Low-Thrust Point puts the line of push directly to the load. Provides better leverage, bigger loads. HIGH DUMP with telescoping arms that reach 126 inches to hinge point.

Integrated Attachment Options for a multitude of jobs include pick-up sweeper, rotary broom, angle dozer, fork lift, swinging crane.

Backhoe Attachment Facilitates the installation of any model of the world famous Davis Backhoe.

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Rickreall
Rickreall Farm Supply, Inc.

Silverton
Cascade Farm Machinery Company
707 McClaine Street

IN TEXAS:

El Paso
The Myers Company
140 North Cotton

IN UTAH:

Ogden
Thompson Lumber & Hardware Company, Inc.
2380 South 1900 West

Salt Lake City
Lund Machinery Company

IN WASHINGTON:

Battle Ground
Clark County Dairymens Co-Op

Burlington
Van's Equipment Company
103 South Garl

Pasco
Guenther Tractor Company, Inc.
303 South 4th

Tacoma
Evergreen Equipment Company
505 Puyallup Avenue

Yakima
Turner Implement Company
2006 South 1st Street

IN WYOMING:

Douglas
Ranch Supply
242 North Second

Sheridan
York's Shop

LOW BIDS

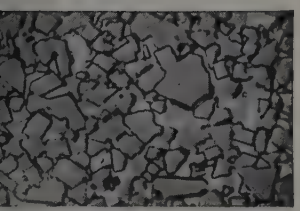
(Continued from page 78)

Summit County, and $614,357 fo grading, surfacing and 3 concret structures on 6.4 mi. of Interstat Highway 70 in Grand Count **Wells Cargo, Inc.** of Las Vegas, Ne vada submitted a low bid of $1 724,939 for grading, surfacing an 1 concrete underpass structure o 8.5 mi. north of Beaver in Beave County. A low bid of $853,934 wa submitted by **Jack B. Parson Con struction Co.**, Smithfield, for 2 con crete structures, Rattlesnake Pas East Snowville, on 7.2 mi. in Bo Elder County. **Tolboe & Harli Construction Co.**, Salt Lake City submitted a low bid of $500,57 for 1 overpass structure in city o North Salt Lake, Davis County **L. A. Young Sons Construction Co** Salt Lake City, submitted a low bi of $404,194 for grading, surfacin and structures on State Road 1 near the Carbon County line i Carbon County. **Waterfall Con struction Co.** of Ogden submitte a low bid of $191,984 for 4.2 m of grading, surfacing and relate work from Junction of F.A. Route 580 and State Road 4 through West Warren in Webe County. A low bid of $176,026 wa submitted by **Sorenson Construc tion Co.**, Murray, for 5.9 mi. o grading and surfacing near Wood ruff in Rich County. A low bi of $360,361 was submitted by Ne son Bros. Co., Salt Lake City, fo 10.7 mi. of grading and surfacin in and near Mountain Home i Duchene County. **Roberts & An derson Co.** submitted a low bid o $203,341 for 6.7 mi. of gradin surfacing and related work nea Brown's Canyon in Wasatch an Summit counties. **Olof Nelso Construction Co.**, Logan, su mitted a low bid of $333,860 fo grading, surfacing on 8.5 mi. o U. S. 6 and 50 in Carbon an Emery counties.

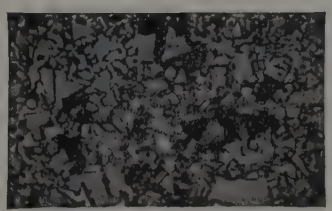
WASHINGTON

Cherf Brothers Inc. & Sandk Contractors, Inc., Ephrata, re ceived a $2,155,892 contract f 1.2 mi. of grading and surfacin in city of Tacoma, Pierce Count A $1,524,335 contract was receive by **Wilder Construction Co., Inc** Bellingham, for 4.8 mi. of gradin surfacing and related work in ci of Bellingham, Whatcom Count **John P. Hopkins Co., Inc.**, Merc Island, received a $840,464 contra for construction of Hood Can

Longer bit life— with *new* Sandvik Coromant Bits



ndvik Coromant Tungsten Carbide
Microphoto) Uniformity of size, en distribution of grain are mark-. Free from porosity and impurities therefore stronger, longer-lived.



Low quality Tungsten Carbide
(Microphoto) Black marks are contaminations caused by deficient production control. They weaken the carbide, reduce its working life.

Sandvik Coromant Detachable Bits are Available in the following Thread Sizes and Bit Diameters

Type	Thread	Available Diameters, In Inches															
		1¼	1⅜	1½	1⅝	1¾	1⅞	2	2⅛	2¼	2⅜	2½	2¾	3	3½	4	4½	5
SHOULDER	TAPER	x	x	x	x													
	F		x	x														
	113		x															
	H			x	x	x	x	x		x								
	115			x	x													
	D						x	x	x	x	x	x	x	x				
	K													x	x	x	x	
BOTTOMING	1" Rope				x	x	x	x		x								
	1¼" Rope						x	x	x	x		x		x				
	400						x	x		x		x						
	1½" Rope											x	x	x	x	x		
	600											x	x	x	x			
	700													x	x			
	J7.5															x	x	
	2" Rope														x	x	x	x
	1000																x	

NEXT time you buy bits, specify Sandvik Coromant because they give more footage per bit, lower drilling costs. Here's why:

1 Only first-quality tungsten carbide is used —as shown in the microphotos above. This means less wear, longer life and a better job.

2 The bodies are precision-made of high quality alloy steel—tough enough to take the strain throughout the extra-long bit life.

3 The bigger Sandvik Coromant bits are all of X-design, which prevents rifling. No wonder Sandvik Coromant inserts are the most widely used in the world, drilling more than one billion feet every year.

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Bridge, Unit 3 and approaches, in Jefferson County. **F. R. Hewett Co.,** Spokane, received a $648,590 contract for 12.4 mi. of grading and surfacing from Loon Lake to Cottonwood Creek in Stevens County. A $626,068 contract was received by **Strong & MacDonald, Inc.** of Tacoma for 3.1 mi. of grading and surfacing P.S.H. 9 in Clallam County. **MacRae Bros. Co.,** Seattle, received a $594,506 contract for construction of undercrossing on the Seattle Freeway in city of Seattle, King County. **John E. Alexander, Inc.,** Seattle, received a $557,070 contract for construction of Yakima River and Naches River bridges and Selah interchange structure in Yakima County. A $525,694 contract was received by **F. H. DeAtley & Co.,** Lewiston, Idaho, for 11 mi. of grading and surfacing, Franklin County Line to Hedrick-Coleman road in Adams County. **Peter Kiewit Sons' Co.,** Seattle, received a $420,951 contract for 1.6 mi. of grading and surfacing in the Blue Lake vicinity in Grant County. **Pacific Sand & Gravel Co.,** Centralia, received a $304,950 contract for 3.9 mi. of grading and surfacing on P.S.H. 9 in Grays Harbor County.

WYOMING

Gilpatrick Construction Co., Inc. of Riverton received a $520,682 contract for grading, surfacing, structures, and related work in the Basin Urban area and Rural area on the Greybull-Basin road in Big Horn County. **Hoak Construction Co.,** West Des Moines, Iowa, submitted a low bid of $1,513,367 for kilovolt transmission line, Kortes-Cheyenne. **Northwestern Engineering Co.,** Denver, Colo. received a $436,366 contract for construction of **Iron Mountain Interchange** structures, each consisting of 4 flange girder spans over the 4-lane divided highway including approaches, ramps, and related work on the Chugwater-Cheyenne road from Cheyenne north, in Laramie County. **Central Construction Co.,** Rapid City, S. Dak., received a $306,757 contract for construction of 1 interchange structure and 1 bridge and related work on 11.9 mi. of the Buffalo-Gillette road in Johnson County. **Big Horn Construction Co.,** Sheridan, received a $168,510 contract for grading and surfacing on 7.6 mi. of the Torrington-Nebraska State Line road in Goshen County.

WORKING and storage space provided by Beatty horizontal shores which eliminate verti shoring is put to good use in city lot building by Oakland contractor.

Expandable shores cut costs on apartment building job

PAUL E. PETERSON Construction Co. of Oakland used Beatty-Pecco horizontal steel shoring beams to support a 15,000-sq. ft. deck of an apartment building in Oakland. Cost savings that resulted "exceeded expectations."

The telescoping supports adjust to spans from 8 ft. 9 in. up to 27 ft. 7 in. For the use illustrated above they were set in two widths—8 ft. 9 in. and 19 ft. The former requires center-to-center spacing of 48 in. and the latter 32 in. to support the 6-in. slab.

Vertical support was needed only at walls. Beatty screw-type steel vertical shoring frames were used at these wall supports, and Sydney Carnine, superintendent, stated: "Height adjustments could be made accurately at any point with the turn of a lever.

Carnine estimates that three times as many vertical supports would have been required with standard construction methods and that the structure was ready for slab pouring in less than half the time ordinarily required.

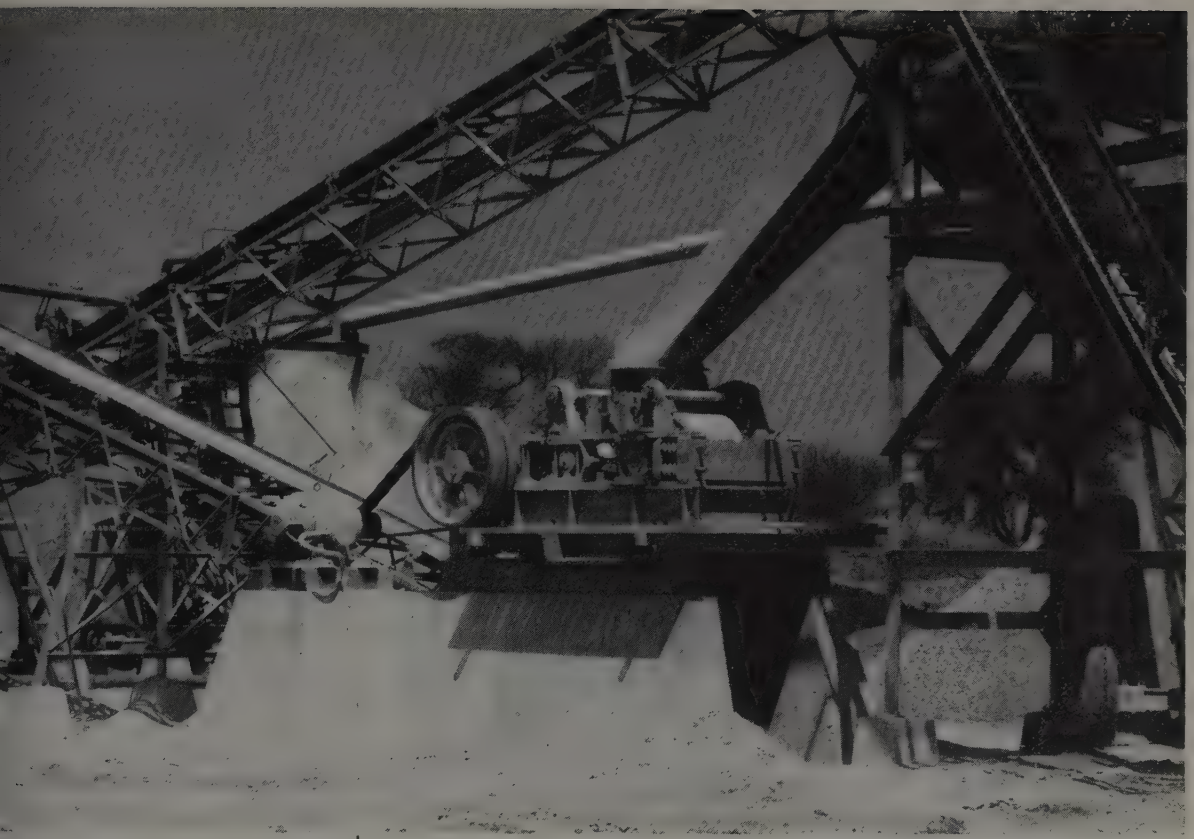
He also pointed out the advantage of clear work space beneath the horizontal beams. "City sites seldom provide much work space outside of the building. The horizontal shoring gave us plenty of space to set up our lumber cutting equipment and stockpile. It also provided space to store shipments of all types of equipment under shelter and in the most convenient locations."

Carnine had only one concern in his first venture with this ne type of construction. "When you used to working with straight ti ber beams, the slight camber these steel beams looks like som thing to worry about. Even thou I was assured that this camber w engineered to adjust perfectly u der load when the center-to-cent spacing was right, I put up my ow string test under the first slab s tion to make sure that the bea leveled out properly when the co crete was poured. They did."

L. E. McMillin, of Beatty Sc fold, points out that cost savi from the use of horizontal rath than vertical shoring increase w the height of the building.

"In multi-story building co struction today, the contractor required to leave vertical shori in place until the top floor or ro slab has been poured. This quirement means that the contr tor must supply enough verti shoring for all floors. The ho zontal beams can be stripped qui ly and easily without disturbing t vertical shores at beam ends.

"The Beatty-Pecco Span has a shaped beam with a wide up flange providing torsional stren for stability and safety. The wed lock fastens the lattice and pl sections at the reqired span wit single blow of a carpenter's ha mer, requiring no bolts, nuts special tools. The beam weigh lb. per foot, and two men can ca and place the average 15 to 18 beam easily."



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- **Requires less h.p. per ton produced**
- **Freedom from stresses**
- **Simple maintenance, effective lubrication**

All Diamond units have two rolls . . . one is fixed, the other floats. To allow a slight cushion effect, and eliminate wear and tear due to shock, heavy tension springs hold the floating roll and permit quick opening in the event of overloading or in case tramp iron or other foreign materials enter between the rolls. This protects shells and other parts against damage.

Accessible mechanism and ease of adjusting the opening between the roll shells allow the size of the product to be changed at will.

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ENGINEERS and CONTRACTORS

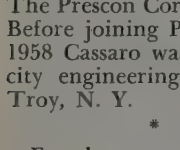
Lloyd R. Turk, Oregon State Highway Department assistant resident engineer in Portland, has been promoted to resident engineer in charge of highway construction work in the Oswego area. Replacing Turk in the newly created metropolitan division in Milwaukie is **Jonathan R. Rose.**

* * *

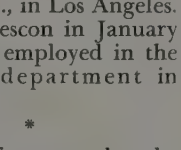
Michael A. Cassaro, structural engineer, has been transferred from the Southwestern Division to the Pacific Coast Division offices of The Prescon Corp., in Los Angeles. Before joining Prescon in January 1958 Cassaro was employed in the city engineering department in Troy, N. Y.

* * *

Further appointments by the Portland Cement Association in the Los Angeles area are announced. **John E. Richter** is appointed housing specialist. He has been a member of the PCA staff since November 1956 when he joined as a field engineer. He now succeeds **George M. Petzar** who recently became district engineer of the Phoenix of-



RICHTER



WIRKUS

fice. The new field engineer in the metropolitan Los Angeles area is **Eugene A. Wirkus.** For the past seven years, Wirkus has been with the California Division of Highways, where he was an associate highway engineer in the design department.

* * *

Ray E. Holmes, chief of the Rivers and Harbors Section, Engineering Division, Portland District, Corps of Engineers, since October 1956, has accepted an assignment as chief of the Planning Branch of the Seattle District.

JOHN MacLEOD, president of Macco Corporation, congratulates *William E. Bailey,* general superintendent of Rigging Division, Pacific Crane & Rigging Co., for outstanding safety record made during 1958 and the winning of the John MacLeod safety trophy.

J. Edward Johnston officially took over the post of traffic and research engineer for the State Road Commission of Utah on June 1. Johnston comes to his new Utah position following 25 years in highway design and engineering. He will work under the direction of **Rulon J. Ballard,** assistant director for engineering. His two chief assistants are men already in the department, **Gerald Matthews,** chief research engineer, and **Willard Kemp,** acting traffic engineer.

* * *

Herbert C. Higgins recently retired from the Washington State Highway Department after thirty years of service to become The Asphalt Institute's district engineer for the states of Washington and Alaska. Higgins is the first district engineer to serve the state of Alaska, which is included in the Pacific Coast Division of the Institute under the supervision of Division Managing Engineer **B. A. Vallerga,** Berkeley, Calif.

* * *

Reassignments of two resident engineers are announced by the Utah State Road Commission. **Sherman Burton** has been placed in charge of construction of a 280-ft. concrete and steel overpass north Salt Lake City. This 250-d contract was awarded to Tolboe Harlin Construction Co. **Geor M. Anderson** was appointed re dent for the State on a portion Interstate Defense Highway 70 b tween Floy and Crescent Junctio W. W. Clyde Construction Co. contractor on this 250-day proje

* * *

Caswell U. Forrest, associat with Robert E. McKee, Gener Contractor, Inc. of El Paso for years and a vice president of t company, has accepted the exec tive vice presidency and gener managership of the Univers Grading Co., Inc. of Albuquerqu N. Mex. Forrest, a civil enginee came to New Mexico in 1944 a resides in Albuquerque.

* * *

North Pacific Division safe plaque for "sustained achieveme in accident prevention" over t past 5-year period recently went the Walla Walla, Wash., office the Corps of Engineers. In ad tion to this District award, Di sion Engineer safety awards f 1958 will be or have been present to three C. of E. organization units, and three contracting firi in the Walla Walla District: I Harbor Dam Residency, and Mo tag-Halvorson-Austin & Associat contractor; Larson AFB Residen Moses Lake, Wash., and N. Fi rito Co., contractor; Mounta Home AFB Residency, Idaho, a Nelse Mortensen & Co., Inc., co tractor at Glasgow AFB Residen

Alaska District was also the cipient of the North Pacific Di

CALENDAR

Sept. 14-17—American Mining Co gress, Denver, Colo.

Oct. 11-16—American Society f Testing Materials, Pacific Ar National Meeting, Sherat Palace Hotel, San Francisc Calif.

Oct. 19-23 — American Society Civil Engineers, annual conv tion, Hotel Statler, Washingt D. C.

Oct. 26-28—American Road Bui ers' Association, National Hig way Conference for County En neers and Officials, Hotel Lea ington, Minneapolis, Minn.

Dec. 2-3 — The Asphalt Institu annual meeting, Shoreham H tel, Washington, D.C.

Jan. 20-21—The Beavers, ann meeting, Los Angeles, Calif.

on Engineer's award for an outanding safety record during the 958 construction season. **Col. erbert Turner,** assistant to the ivision engineer, presented the aque to **Col. W. C. Gribble, Jr.,** laska District Engineer, and 'ardie King, chief of the Disict's safety branch.

* * *

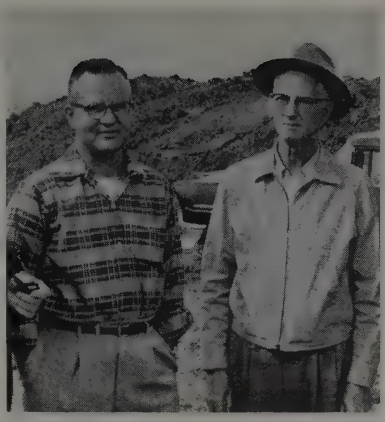
Earl W. Homan and **Richard D. awrence** announce the formation a new company to be known as oman and Lawrence Engineering ., with offices at 1295 Folsom ., San Francisco. Both men are aving the Macdonald Engineerg Co. to head up the new organation as president and vice presint respectively. They will spealize in slip-form construction.

* * *

Charles H. Lee, consulting engier, has formed a partnership th **Michael Praszker,** his former ief engineer, under the firm me of Lee and Praszker, Conlting Civil Engineers. Offices d soil testing laboratory will reain at 58 Sutter St., San Franco.

* * *

Ralph Cutler has been named vice president of Yuba Consoli-



E. F. BUTLER, left, is project manager, and *Tom Cain* resident engineer on the $16,000,000 Colorado aqueduct siphon job, under construction by American Pipe and Construction Co. for Metropolitan Water District of Southern Calif. Article describing the project starts on page 27.

dated Industries, Inc., and general manager of Southwest Welding & Manufacturing Division.

* * *

William P. Rus, former resident engineer on two of the San Francisco Bay area's largest construction projects, has opened offices in Palo Alto. After six years with Utah Construction Co., Rus resigned his position to establish his own firm at 136 Hamilton Ave. During the past six years, Rus engineered the initial phases of the Alameda Bay Farm Island project, and supervised the engineering and construction phases of another huge land reclamation project at South San Francisco. A member of the American Society of Civil Engineers, he holds a license as a general engineering contractor and a supplemental license as a general building contractor, and will continue to be active in these fields, operating as William P. Rus, Inc.

* * *

Promotion of **Alfred K. Allen** to special vice president of Utah Construction Co., San Francisco, is announced. He has been on the staff of Utah's construction division since early 1958.

* * *

N. R. Gindrat, civil engineer, was one of five long-time members of the engineering and construction divisions of Henry J. Kaiser Co., recently honored at a dinner and ceremony on their retirement from the Kaiser organization. Gindrat was an assistant chief design engineer for the Oakland firm.

SUPERVISING the jobs

R. W. Erickson and **K. J. Erickson,** superintendents, with **R. G. Schasteen,** shop superintendent, are chief supervisors handling a recent award to Erickson Paving Co. in the amount of $865,793. The site of the job is at Koren to Junction of P.S.H. 11 in Adams County, Wash., and consists of 12.9 mi. of grading, surfacing and related work. Under way since March, the job will be finished about February next year, according to **C. W. Erickson,** secretary of the firm.

* * *

Floyd Hardenbrook, project manager, and **C. E. Furstenwerth,** general superintendent, are key men employed by B-E-C-K Constructors, McLaughlin and Associates on construction of composite buildings and additional facilities for the U. S. Air Force at Shemya in the Aleutian Islands, Alaska. Supervising work on the $8,682,451 project is **Wilfred J. King,** while **Fred Meserve** is the project engineer, and **Fred Pankratz,** the dirt superintendent. Scheduled to be completed late September next year, the project got under way in mid-March.

* * *

S. Daniels, project manager for Allison & Haney, Inc., has charge of this contractor's $2,318,235 contract for 3.5 mi. of grade, drain and surface, including 4 bridges, surfacing, soil cement base and concrete base, located west of Gallup, N. Mex. Office manager is **Mel Williams.** Structure superintendent is **K. Shaffer,** and the following are foremen: **George Conder,** carpenter, **C. V. McBride,** grading, **T. E. Doty,** crusher, and **Don Bradherson,** pile-driving. Started in March, the job will probably end next May.

* * *

Cecil Smith, superintendent, and **Milton Gracia,** project engineer, are Madonna Construction Co.'s principal men on a recent award in the amount of $376,159 for repaving with imported base and PCC the northbound expressway lanes for 3.9 mi. on U. S. 99 between Berenda and Califa in Madera County, Calif. Job has been under way since May and will soon be finished.

* * *

C. R. "Spot" Denton, general superintendent, has charge of a $172,265 job for Northwestern Engineering Co. Located in Sheridan County, Mont., the work lies between Plentywood and the Canadian line road and covers 15.6 mi. of plant-mix surfacing. **Roy McDuffee** is hot plant superintendent on this short job soon to be complete.

DENTON

* * *

R. G. Henderson, construction superintendent, and **Clyde Weatherly,** bridge superintendent, under the direction of **Paul Hunt,** owner of Hunt Construction Co., head the construction crew on a recent award to Hunt for 2.5 mi. of grading, structures, and surfacing south from Carbondale on State Highway 133 in Garfield and Pitkin counties, Colo. Crusher boss on the $193,462 job is **R. J. Durbin,** while **L. M. Alexander** is operator, and **Carl Miller,** transport driver. Now nearing completion, the work has been going since April.

* * *

E. G. Bellamy is supervising a $181,923 job for Q. L. Rufener, Inc. in Deschutes County, Ore. A state highway job, work consists of grading and oiling on 3.6 mi. of the Deep Canyon-Deschutes River section east of Sisters. Rufener reports that work started May 7 and he expects to be finished by Sept. 1.

M. V. Kelly, vice president ar general superintendent of Brow Ely Co., together with **Edward Burke,** job superintendent, h charge of a recent award to t company to widen to 4 lanes U. 99E, Yuba City north in Sutt County, Calif. Representing t State as resident engineer is **Jam Meek.** Now about finished, the j has been in progress since April.

* * *

Lawrence Rovedo, superinten ent, is in charge of a structur and grading contract for Gardn Construction Co. in the amount $298,388. Foremen on the jo which lies north and south Aquilar on State Highway 1, Hue fano and Las Animas countie Colorado, are **Harold Hasse,** ca penter; **Mike Raehal,** steel, ar **Charles Tibbetts,** labor. Under w since May, the work is schedule for September completion.

* * *

Merrill Dubach, general supe intendent, and **Ralph Knight,** a sistant superintendent, head t list of job personnel on a $1,39 945 contract for new constructi from Madison to 5 mi. south Winters, Calif. Contractor for t 14 mi. of grading, paving and r lated work is Gordon H. Ball ar Gordon H. Ball, Inc. Office man ger is **Lois Stall.** With August 19 the target date, work started May.

* * *

George Borovich is project su erintendent, **Wally Henkel** is ro superintendent, and **Tommy Ste art** is structure superintendent f Thomas Construction Co., rece awardee at $178,276 for gradin surfacing about 1.4 mi. of 2-la highway, including 3-span brid west of Red Bluff in Tehan County, Calif. Carpenter forem is **Merle Hobbs;** master mechan **Jess Whitledge.** Scheduled for Se tember closing, the contract h been under way since April.

* * *

Harold Anderson and **Al Myru** shifters, and **Carl Johnson, J** timekeeper, under the direction **N. V. Lamb,** head of N. V. Lam Construction Co., are key men this contractor's job of 4.7 mi. grading, and surfacing, on t Manville-south road in Niobra County, Wyo. Work is just sta ing on the $179,726 contract whi is expected to be concluded abo the middle of October.

* * *

Milo Gibson, superintende aided by **John G. Kent** and **W. Lennon,** foremen, has been put

IEW DW21 SERIES G "LOADS FAST AND HAULS FASTER"

Supt. Ruben Hawkins, Harbaugh & Wright, Inc., Enid, Okla.

ore production, faster cycles, more profit—that's the port on the new Caterpillar DW21 Series G Tractor with w No. 470 LOWBOWL Scraper.

As Ruben Hawkins (see above) sums it up from his perience on a 2½-mile Interstate Highway job in klahoma:

"This new DW21 has plenty of power. It loads fast d hauls faster."

The contracting firm of Harbaugh & Wright, Inc., ought in four new DW21s to move 1,263,218 yd. of t on this project. On the first 10-hour day, they handled 4 loads of 19 cu. yd. on an 1,100-ft. haul. And they pt up this blistering pace to finish the job 40 days ead of schedule!

For the down-to-earth facts on this great new heavy-ty wheel rig, see the box below. Note that the new DW21 Series G gives you important increases in horsepower, rimpull and scraper rating. Standard tires have also been increased to 29.5-29 (28-ply rating) to handle the increased scraper capacity.

Your Caterpillar Dealer has the complete story on the important new DW21 Series G—and he'll prove what he says with a demonstration on your job.

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NEW DW21 SETS NEW STANDARDS OF EARTHMOVING

t DW21 Series G Tractor with No. 470 Scraper is pushloaded Cat D9 Tractor on Interstate Highway job in Oklahoma.

NEW DW21-NO. 470

	Series G	Series B
NEW HP	—345 (maximum output)	—increased 8%
NEW RIMPULL	—49,100 lb. (maximum)	—increased 12%
NEW SPEEDS	—increased rimpull provides up to 20% faster travel speeds under similar haul road conditions	
NEW CAPACITY	—19.5 cu. yd. (struck)	—increased 8%
	27 cu. yd. (heaped)	—increased 8%

Corresponding increases have been made in the new four-wheel DW20.

charge of a recent award to Wilbur Christensen Co. to grade, surface and erect structures on 5 mi. of highway southwest of Gillette-west in Campbell County, Wyo. Wilbur was awarded the contract on a low bid of $464,202; expects to start work in about a month, and finish the job by next January.

* * *

Edwin Castle, project manager, and **Russell Egosque,** general foremen, are A & B Construction Co.'s key men on a lateral and drain construction award in the amount of $1,242,448. Located in the Missouri River Basin Project in Montana, work is on schedule 1 and 2, earthwork and structures, north and east side laterals and drains, Helena Valley Unit. Work on the $1,242,448 project started in June and contractor expects to have it finished about December next year.

* * *

R. H. Heitman, project manager, **Earl Barnard,** superintendent, and **C. W. LeCount,** project engineer, head the list of personnel on a $1,838,924 job recently won by John Delphia and Fred J. Early, Jr., Co. Under way since May, the contract covers grading and paving to construct 3.3 mi. of 4-lane freeway and construction of 3 bridges near Soledad, Monterey County, Calif. Job will be finished about May next year.

* * *

Victor L. Jackson is superintending a $434,052 award to General Contracting Corp. for construction of two reinforced steel concrete structures located in Bountiful, Utah. Grade foreman is **Murray Wilson. Jack Cannon** is office manager. Scheduled for October completion, the job started in May.

* * *

Ray Travis, superintendent for T. M. K. Construction Co., is head man on 7 mi. of Interstate highway west of Gila Bend, Ariz. The $1,074,872 contract covers grading, surfacing and construction of overpass structures on the Yuma-Casa Grande highway. Foremen are **R. C. Sullivan** and **Robert Kriese;** master mechanic, **Stan Beloat;** hot plant and crusher foreman, **Jack Walker. Art Nylund** is estimator. The office is managed by **Bob Maud.** Job started in April and will probably end this November.

* * *

L. A. Crow, project manager, **W. L. Sanders,** general superintendent, **E. L. Combest,** master mechanic, and **T. E. Dooley,** office manager, comprise the chief personnel of John Delphia, Fred J. Early, Jr., and L. A. & R. S. Crow Co., handling the grading and surfacing of 3.7 mi. of 4-lane freeway north of Trinidad, Humboldt County, Calif. The $2,288,888 project got under way May 1, with completion scheduled for next June.

* * *

Ernest J. Sands is supervising construction of 4-lane divided highway, 4.3 mi., in Kootenai and Shoshone counties, Idaho, for Morrison-Knudsen Co., Inc., which successfully bid the job at $2,171,771. Office manager is **Tom Sales.** Earmarked for completion October next year, work here started in April.

* * *

Joe C. Hastings, project manager, assisted by **Gene Hartpence,** is in charge of an Imperial Paving Co. contract for grading and surfacing near Crownpoint, McKinley County, N. Mex. The $134,532 job, under way since May, will be finished about October.

Hastings and Hartpence are top men also on another Imperial contract in the amount of $232,194 for 7.9 mi. of grading, surfacing and related work near San Mateo in McKinley and Valencia counties. This job is expected to be finished in December.

* * *

William DeJager is supervising a $396,927 job under way by C. M. Corkum Co., Inc. in Multnomah County, Ore. Work consists of grading, paving and structure, cut and cover tunnel retaining walls, etc. on the Washington County line section of Pacific Highway. Corkum expects to conclude the work by December.

* * *

Gene Herrington is acting as superintendent on construction of two bridges and approaches at Champers and Chipps creeks in Plumas County, Calif. Contract went to G. S. Herrington, Contractor, on a low bid of $215,996. Mechanic on the job, which started in May and will be finished about October, is **Jim Lewis,** while carpenter foreman is **"Woody" Woodrich.**

* * *

Merlyn J. Marks is supervising a $716,294 job for Peter Kiewit Sons' Co. First section of the Central Point by-passing project of Highway 99 in Jackson County, Ore., work consists of 4.5 mi. of grading and surfacing on the Seven Oaks-Table Rock road section of Pacific Highway. About 715,000 cu. yd. embankment in place is involved: 215,000 cu. yd. with DW21s, rest with Euc belly-dumps; 2,350 cu. yd. of box culverts; 6,30 cu. yd. loose riprap. **Sherm C. War** is structure superintendent; an **Erv Jensen** is master mechanic. Jo office manager is **Harry Eckstei** Job sponsor at Kiewit's Medfor office is **R. B. Miller.** Work starte here in May; will be finished i October.

* * *

J. V. Beach, superintendent fo Silver State Construction Co., head man on construction of a po tion of state highway system c U. S. 50 west of Eureka, Nev. Gra ing foreman on the $444,587 pro ect is **Joseph J. Montrose.**

* * *

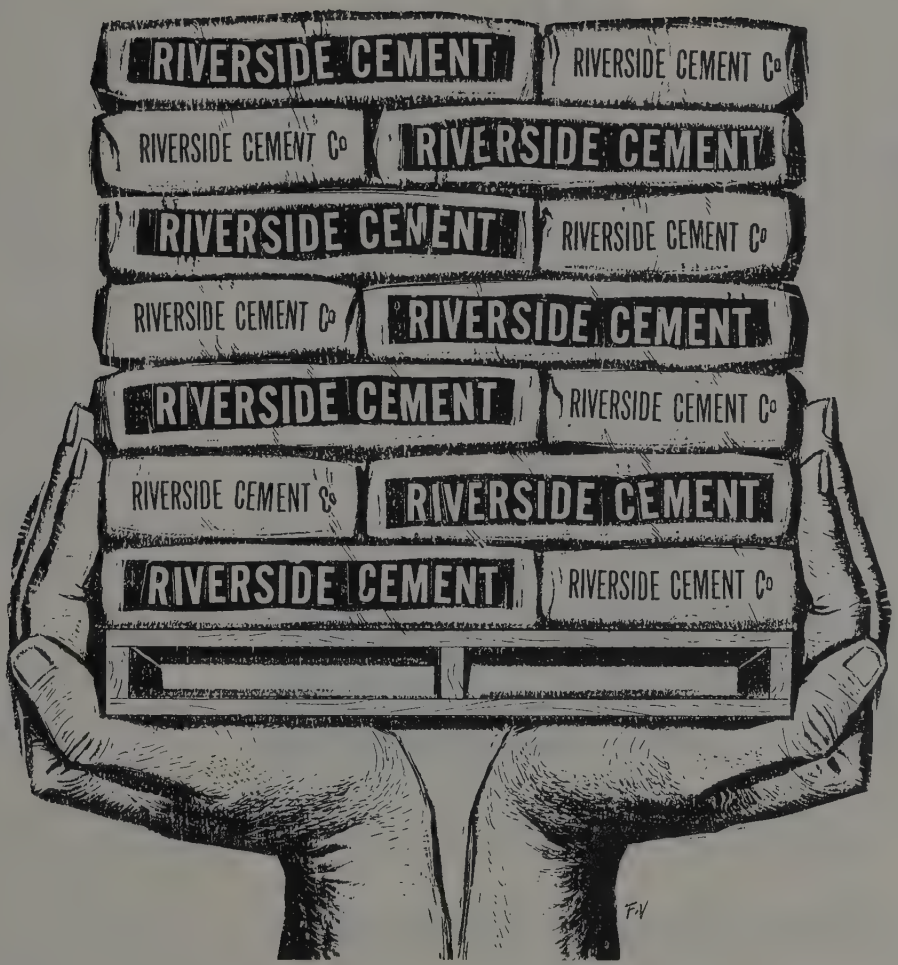
Homer J. Olsen, superintende for Peter Kiewit Sons' Co., is supe vising a recent award to Kiewit i the amount of $1,572,166 in co nection with reconstruction on th San Francisco-Oakland Bay Bridg A new ramp is being built and portion of the upper deck in Sa Francisco is being remodeled fo truck traffic. Other key contracto men on the project are: **Evere Clark,** project engineer; **Jack Tri olet,** office manager; **"Sailer" Han by,** master mechanic; **Orville Saa feld,** carpenter superintenden **Bill Turnbow,** concrete superinte dent; **Marven Rogers,** finishing su perintendent. Also these foreme **"Chink" Harmon, Elmo Boyc Walt Muthert,** and **John Smith** carpenter; **Curt Temple, "Whitey Boettcher,** and **Ernie LaFrombois** labor; and **John Kaufman,** excav tion. Set for completion about mi May next year, the job has bee going since April 20.

* * *

Roger White, structure superi tendent, **Don Nold,** engineer, an **Bob Neikirk,** job office manage are key men working for Peter Ki wit Sons' Co. on a $1,360,740 co tract for 4.2 mi. of grading, surfa ing and construction of 3 overpass on the Dillon-Butte road in Silve Bow County, Mont. **D. N. Dillo** is job sponsor at Kiewit's Billing office. Work on this Interstate co tract started in late June, schedule for completion in the fall of 196

* * *

John F. McCoy is grade superi tendent for William A. Smith Co Inc., contractor on relocation of th Alaska Railroad at Clear, Alask Project engineer on the $1,676,5 project is **James M. Rose.** The o fice is managed by **W. J. O'Brie** Track superintendent is **Fran Quiroz.** Scheduled for Octobe close, the job has been under wa since April.



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CONSTRUCTION BRIEFS

Divers place concrete ring inside John Day cofferdam

IN THE CONSTRUCTION of the north shore cofferdam at the Corps of Engineers' John Day Dam site, Morrison-Knudsen Co., Inc., is building a huge 15-steel-cell cofferdam that elbows out into the river at the apex of two long earth abutments. Eventually, the cofferdam will barricade off the Columbia River and form the work area within which will be constructed the John Day navigation lock, north shore fish ladder and 20 spillway bays of the huge $350,000,000 project.

To construction workers, cofferdams, like people, have individual personalities. The John Day cofferdam, to date, has been a cantankerous, uncooperative, disagreeable so-and-so from the first pile-driver lick. The contour of the river bottom at the site, besides being strewn with huge boulders that make difficult the task of driving the steel piling of the cofferdam cells, slopes shoreward into a fairly deep channel, creating a slippage hazard that must be compensated for as each steel cofferdam is formed.

To provide insurance against this slippage of the cofferdam cells, once the unwatering from the steel ringed enclosure begins and the cells must start absorbing all the pressure of the outside river, the Army Engineers has specified a concrete footing for the inside rim of each cofferdam cell. This sounds simple enough, but when this concrete rim footing must be put in place under 40 to 50 ft. of water, the problem becomes a little complicated.

On the John Day cofferdam job, the divers are lowered into each cofferdam cell in a screened diving cage to the river bottom. Lowered alongside of them is an 18-in. flume that acts as a chute down which is dropped the hundreds of 60- sacks of concrete and sand seali mixture. Working under water, diver piles these sacks six hi along the inner circumference the steel cell, tapering them off a second row of four sacks high a third of two sacks high. This for a solid sealing barricade along inside rim. The action of the wa on the mixture of concrete a sand eventually sets it to form solid wall.

Once the bottom inside rim the cell has been sealed, the 80 deep cylinder is poured full gravel and aggregate to force the water and form a solid earth cylinder extending some 40 above the river surface level. Ea of these circles of steel piling int locks one with the other, to fo the riverward elbow of steel a connecting at the apex of the river and downriver earth-fil levees or abutments. With unwat ing of the area behind this coff dam, the work area for the fi construction step of the John D Dam will be formed.

Pole building booklet

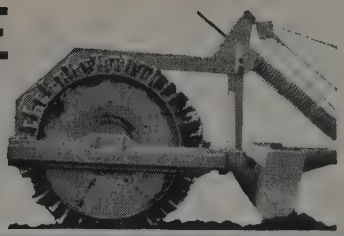
A SECOND EDITION of *H to Design Pole-Type Buildings* been issued. Four pages of te tables and illustrations have be added for those who plan, desi or contract to erect pole-type bu ings.

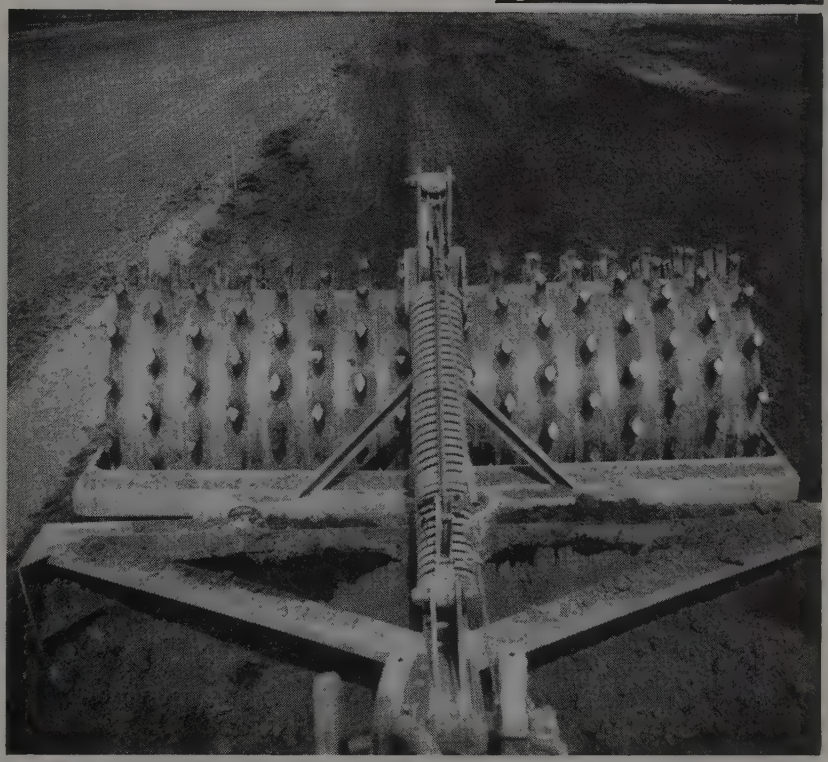
Illustrations and text show h to compute live, dead, wind loa and stresses for every structu member of a proposed pole-t building. An embedment cha tables and text enable users make quick, dependable calcu tions of required pole depths handle anticipated maximum lo and stresses. No plans are sho Designers apply the structural tails in the booklet to highly cialized needs of individual o ers and clients.

Author Donald Patterson, a p ticing engineer of long experie is a nationally known authority pole-type construction. In handbook he presents time-te procedures for proportioning st tural members of pole-type bu ings of all sizes and for many ferent uses.

This 72-page and cover book 5¾x8¾ in., is available for $ a copy, postpaid, from it publis American Wood Preservers In tute, 111 West Washington St Chicago 2, Ill.

AST YEAR HE WOULDN'T OWN ONE —THIS YEAR HE BOUGHT TWO!





e BROS Leveling Tamping Roller* such an uncomplicated ece of equipment that last ar even big grading con- actors like Alley Construc- n Co., of Faribault, Minn. uldn't quite visualize its al value on earthfill work.

But this year, Lloyd Parker, ley's superintendent on the ading job for nearly a million rds at Wold-Chamberlain rport in the Twin Cities, t a BROS G2 Roller-Level ade combination on the job the results were so good at he purchased a second it the *very next day!*

You can easily see why: The veling Roller makes sub- ade rolling a productive m because it produces uni- m, proper densities faster an conventional tamping lers can. The blade puts materials into the voids, building a smooth, el course, permitting equal compaction pres- e over the full width of the drum. Because course is smooth and compaction is fast, apers can haul and spread at faster speeds, ning you greater profits.

The Leveling Blade has 14″ vertical adjust- nt which is controlled from the operator's t by either hydraulic or cable control. The veling Roller is available in rolling capacities m 15,160 lbs. to 44,700 lbs. when roller drum illed with wet sand.

nt Pending

Level Blade Attachments for your present BROS M2 and G2 Series Tamping Rollers are also available. M2 Blade Specifications: 112″ width; 24″ height; and ½″ x 6″ double bevel reversible high carbon steel cutting edge. G2 Blade Specifications: 141″ width; 31″ height; ⅝″ x 8″ square edge reversible high carbon steel cutting edge.

Get complete information on this new profit-making equipment from your nearest BROS Dealer or write us. World-wide sales and service.

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Write today for the full eport on the Ohio tests and or complete new literature escribing the new BROS P-730 pneumatic roller. It's ee of cost or obligation!

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9 AND 13-TON ROLLERS

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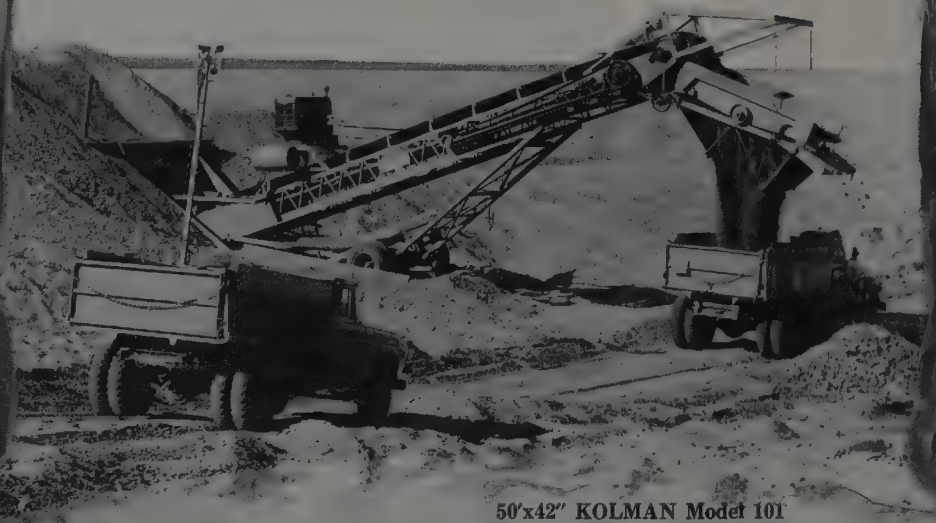
'Man, That KOLMAN Sure Puts It Out!'



50'x42" KOLMAN Model 101

Wherever you see a Kolman Model 101 Conveyor-Screen Plant in operation, you're seeing top screening and loading production. For handling sand, gravel, crushed rock and other material, it takes a KOLMAN to really make the job pay off!

In less than a minute the 42" loads out 20-ton trucks, the 36" loads out 15-ton trucks. And the KOLMANs keep up this pace under the severest operating conditions without a grumble.

Available in 18" to 48" belt widths, the KOLMAN's heavy construction is capable of carrying single, double or triple-deck screens without additional support. What's more, they're mighty attractively priced!

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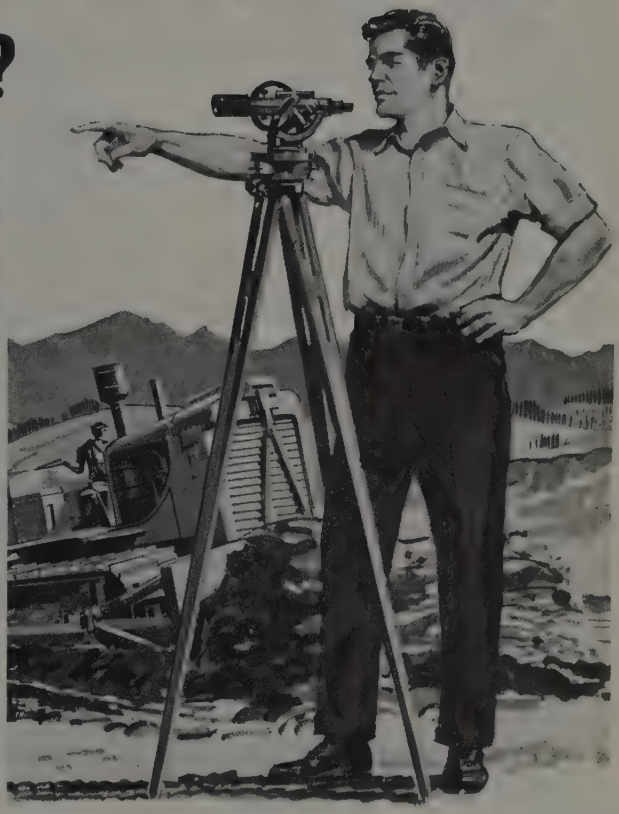

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Men already in the heavy equipment field will find our training can pave the way to a better position, advancement, higher compensation, security. Our method of training makes it possible for you to keep your present job, learn while you earn, to qualify yourself for a better position.

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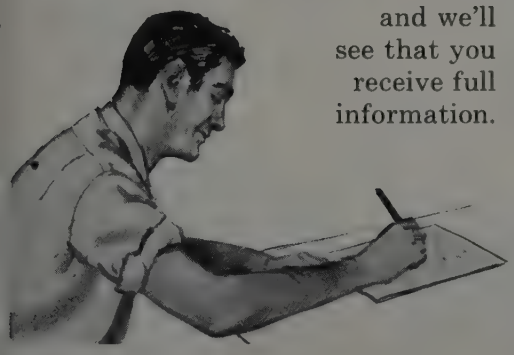

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. . . for more details, circle No. 46 on Reader Service Postcard

Elevator features safety controls

AT THE SITE of the John Hancock Building under construction in San Francisco by the Cahill Construction Co., contractors, a new elevator is being used in a 201-ft. 4-post material tower to raise and lower personnel.

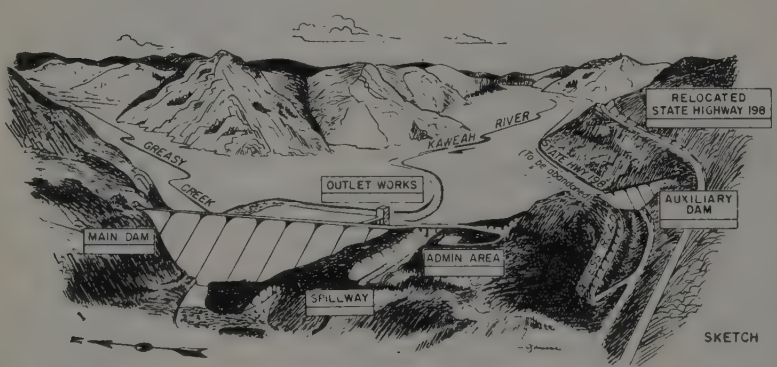
Among the safety features which earned the Mayco elevator the approval of the State of California are 'dead man' controls, automatic brake, top and bottom override limit safeties and broken or slack cable safety. Other features include a two-speed control from within the cage rather than from the ground and a trouble-free hydraulic system powered by either gasoline engine or electric motor. No electrical connections to the cage are necessary. The entire power unit is self-contained and easily moved. The hydraulically controlled winch provides a smooth ride and permits the governing of maximum speeds, both up and down.

The manufacturer points out that the new elevator is adaptable to any existing 4-post material tower, making it suitable for use with presently owned equipment. When it is not being used as a passenger conveyance, it can be used as a material hoist, in which case it can be operated either from within the cage or from controls at the winch unit. Capacity is 3,000 lb.

In many instances today materials still ride up a tall job while men walk. With today's high cost labor, it has become extremely important that neither the time nor energy of men be wasted in unnecessary walking or climbing. The use of temporary elevators for this

purpose has always been extremely costly since they are usually leased for the construction period only. Contractor can own a Mayco construction passenger elevator for less than it usually costs to lease these permanent type elevators.

Specifications and detailed information available on request from Tubular Structures Corp. of America. ... *Circle No. 156*

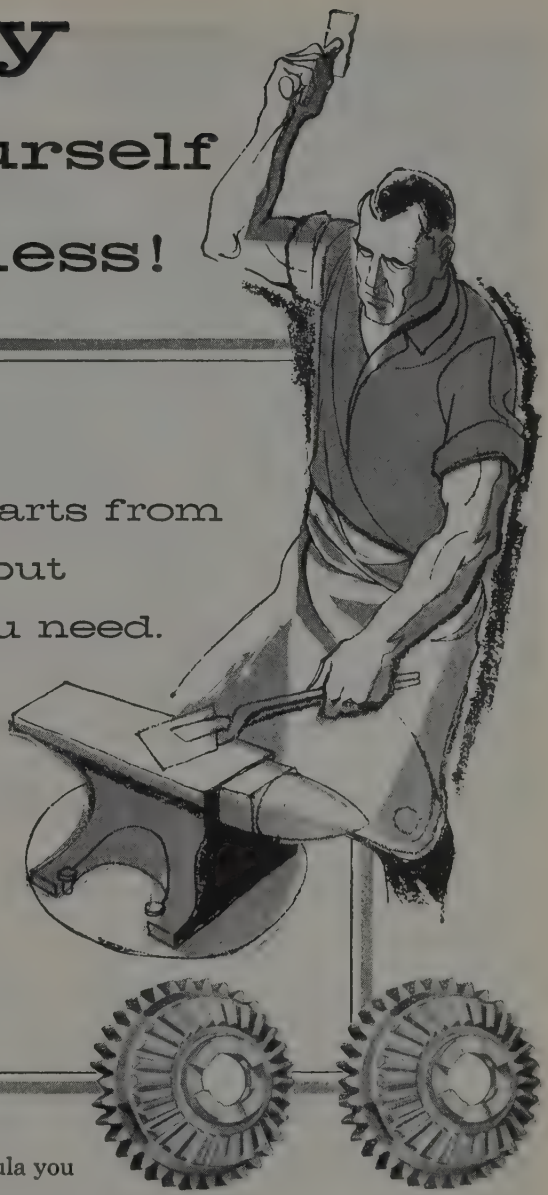


PRINCIPAL FEATURES OF TERMINUS RESERVOIR PROJECT

Construction of an earthfill dam and auxiliary dam is under way at the Corps of Engineers' Terminus Reservoir Project on the Kaweah River near Visalia, Calif. Dam contract of $9,454,196 is held by Winston Bros. Co., and Green Construction Co. It covers 5,600,000 cu. yd. of earth fill, and 1,500,000 cu. yd. rock fill for the outer slopes. Construction will be completed in 1962. Total project will cost $23,000,000.

Easy Way

To Save Yourself Out of Business!



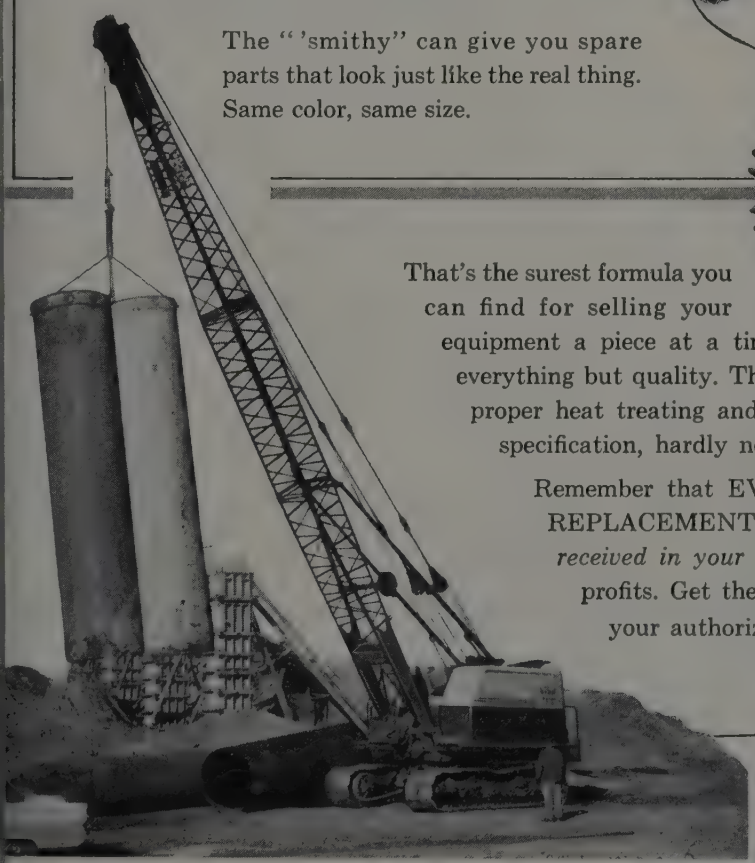
LESSON No. I:

Buy all replacement parts from the "'smithy." He can put together whatever you need.

All parts you buy from him will be a nickel cheaper than those you buy from the authorized dealer.

The "'smithy" has been hounding you for business . . . give him a break.

The "'smithy" can give you spare parts that look just like the real thing. Same color, same size.



That's the surest formula you can find for selling your equipment a piece at a time, too. The "'smithy" can reproduce everything but quality. The kind of quality you need comes from proper heat treating and flame hardening, proper metallurgical specification, hardly noticeable special shaping of every part.

Remember that EVERY GENUINE BUCYRUS-ERIE REPLACEMENT PART is the *same high quality as you received in your new machine.* Don't gamble with your profits. Get the *right* parts when you need them from your authorized Bucyrus-Erie distributor.

BUCYRUS ERIE

Builds Better Equipment

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

Concrete culvert carries water main through fill

USE OF SPLIT-SECTION reinforced concrete culvert pipe is permitting the City of Tacoma's Water Division engineers to save time and expense in laying new mains.

A. J. Benedetti, Superintendent of the City Water Division, reported that the split-section pipe is installed in the trench first, then cast iron main is set in place, and finally covered with the top portion of the concrete culvert pipe.

"This method of construction is relatively new in the Northwest and we feel it has many advantages," Benedetti explained.

He said that, primarily, construction is facilitated considerably. Once the cast iron main is laid and ready for testing, it is easier to locate and determine the extent of any leaks because the main itself is still open for inspection.

"Once the installation is entirely completed, if a break should occur sometime in the future, it will not be necessary to dig up a concrete roadway in order to repair the water main," the Tacoma engineer-superintendent added. "We'll simply dig near the sides of the roadway, pull the cast iron main out of the concrete casing by using chokers.

The method of installation is being used by the Tacoma engineers particularly in connection with construction of the new freeway being constructed from South Tacoma toward Seattle. Approximately $750,000 worth of construction involving the replacement of trunk water mains is involved.

The 20-inch cast iron mains for the freeway replacement are provided by the United States Pipe and Foundry Company of Birmingham, Alabama. They are being placed inside the split-section concrete culvert pipe manufactured by Graystone, Inc., of Seattle.

The cast iron pipe is welded with Tyton rubber welding joint. The 8-foot sections of the 36-inch concrete culvert pipe are sealed at the ends with pre-cast reinforced concrete and plugs.

Robert M. Nichols is the staff engineer, and Joseph N. Winter designed the installation pattern for Tacoma City Water. Contractor on the job is the Morris Construction Co. of Tacoma with Gus Carbone superintending the job. Frank Klarich is engineering inspector.

New book covers building inspection

The first book ever written on inspecting, testing and supervising the construction of buildings, *Field Inspection of Building Construction,* by Thomas H. McKaig, has been published by F. W. Dodge Corp.

The material presented in this new book is of a completely practical nature, and designed for day-to-day use by architects, engineers, contractors and field inspectors. It is not a textbook, and does not delve into theory.

The first chapter of the book is a general discussion of the field inspector's job, and covers coordinating work by the various trades, defining the thin line between over- and under-inspection, keeping proper records, and other problems relative to the job of field inspection.

In five subsequent chapters, McKaig defines the duties and responsibilities of the inspector at each stage of construction. **The Preliminary Stage** is a detailed discussion of contracts, plans, scheduling of work, permits, insurance and tests, location of site and storage of materials, safety measures, inspection and record keeping. **The Foundation Stage** covers preparation for excavation, removal of existing buildings and protection of existing facilities, excavation, sewers, caissons and pilings, footings and foundations, and waterproofing. **The Structural Framing Stage** thoroughly explores use of concrete, steel, wood, masonry, and roofing and siding. **The Intermediate Stage** outlines general requirements such as temporary heating, dust control, protection of work in place, and inspection prior to covering, and discusses metal work, roofing, mechanical trades, walls and partitions, windows, doors and trim and flooring. **The Finishing Stage** gives information on hardware, painting and decoration, masonry and stone cleaning, and on the final checkup by the inspector.

The final chapter is devoted entirely to concrete because of the many special problems involved in getting uniform, acceptable quality. Information is given on types of concrete, appropriate tests, vibration, joints, cold and hot weather pouring, curing and patching.

The 337-page book costs $9.3 and is available from Dodge Books 119 West 40th St., New York 18 New York.

Gavlik Construction & Asphalt Paving Company used this Gar Wood truck crane to place mats during the relocation of U. S. 422 near Shelocta, Pennsylvania.

At ground level... or 10 stories up

it's Gar Wood for precision crane work!

For spotting a load with speed and accuracy you'll find it hard to match a Gar Wood truck crane. That's because Gar Wood cranes are engineered throughout for fast, precision control.

Gar Wood's direct-gear drive delivers a smooth flow of power, without backlash. The operator puts this power to work: easily—because drum clutches are power-actuated ... accurately—because direct manual controls retain operator "feel"... safely—because worm-driven boom hoist provides two speeds up and two speeds down. As optional equipment Gar Wood offers hydraulic coupling that absorbs shock loads.

Call your nearby Gar Wood construction machinery dealer for more information and a job demonstration of the most advanced truck cranes on the market.

Construction of cast-in-place sections of Miami, Florida hotel called for long reach and pin-point precision. The contractor got both with this Gar Wood truck crane.

Gar Wood INDUSTRIES, INC.

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EQUIPMENT SALES COMPANY, Phoenix, Arizona; **SMITH MACHINERY COMPANY, INC.,** Roswell, New Mexico; **STUDER TRACTOR & EQUIPMENT COMPANY,** Caser, Wyoming; **WESTERN MACHINERY COMPANY,** Denver and Grand Junction, Colorado; **SEITZ MACHINERY COMPANY, INC.,** Billings and Great Falls, Montana; **WARNOCK-BANCROFT EQUIPMENT COMPANY,** El Monte, California; **INDUSTRIAL TRACTOR SALES,** No. Sacramento, California; **CRAMER MACHINERY COMPANY,** Portland and Eugene, Oregon.

. . . for more details, circle No. 49 on Reader Service Postcard

MASTER MECHANIC®

Rubber coupling absorbs shock

ROTATING six yards of concrete, the engine take-off units on transit-mix trucks impose a terrific torque load on shaft, coupling and gear elements in the power transmission system. And, when the driver is traveling in city traffic, the normal torque load is increased rapidly as the engine rpm. jumps from idle (55 rpm.) to normal running speed (2,600 rpm.).

The coupling between the ETO and the gear chain driving the mixer takes the full bearing produced by the rapid torque multiplication. So damaging is this load that chain couplings used on seven units being operated by Borchers Brothers in San Jose, California, were breaking down on an average of every six months.

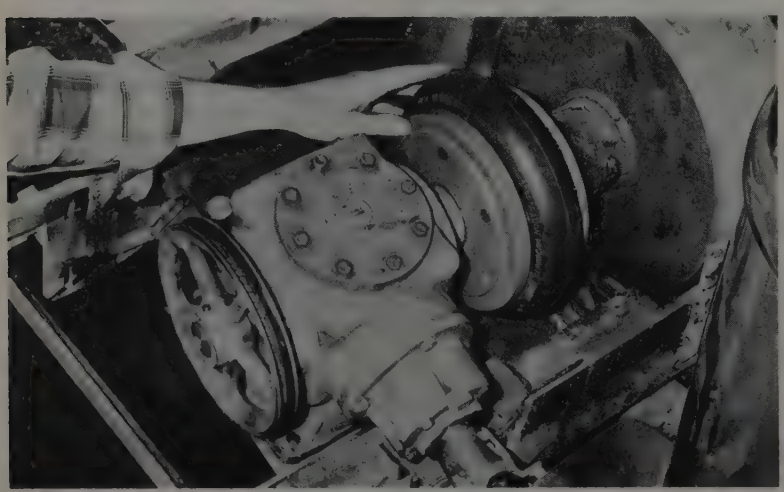
To Borchers Brothers, producers of a complete line of building materials since 1896, down-time is extremely costly. Loss of operating time is even more costly than repair labor and couplings because Borchers needs all mixers on a full 8-hr.-day basis.

Maintenance men at Borchers Brothers began a test that has now solved the coupling breakdown problem. They installed a Dodge PX-11, HF type Para-flex coupling on one of the transit-mix units. Introduced only a year ago, the Para-flex is a flexible cushion coupling with a flexing body that automatically compensates for all combinations of misalignment and end float and absorbs torsional vibration and shock. Heart of the coupling and the element is a tire with synthetic tension members bonded together in rubber. Twin flanges hold the tire in place allowing it to flex at will.

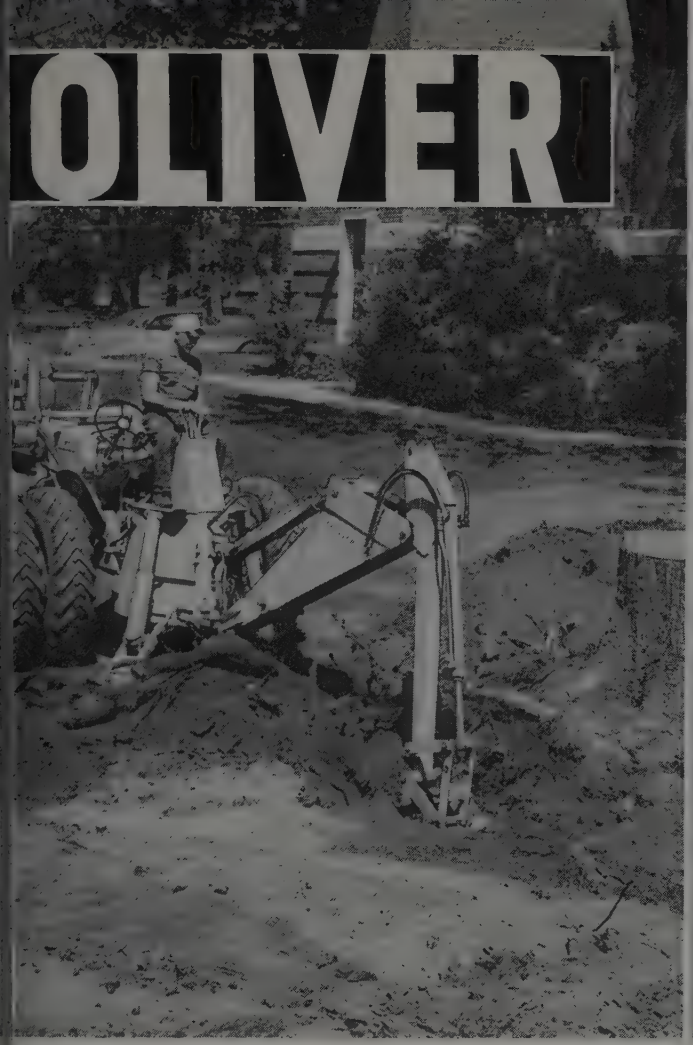
Because the rubber absorbs the high torque shock produced by the transit-mix unit's ETO system, the original Para-flex coupling, installed as a test, is still in operation and shows no signs of wear. Seven of the trucks are now equipped with the "rubber tire" units. Another factor causing high maintenance cost was the chain coupling's susceptibility to dust damage. The natural operation of transit mixers involves a great amount of dust and grit. Maintaining adequate lubrication of the chain couplings was a constant problem, even though a dust cover was used to shield the chain coupling.

With the Para-flex, both dust cover and the lube problems have been eliminated. This coupling has no metal-to-metal contact between shafts and requires absolutely no lubrication. Maintenance of other drive components on the transit mixers has also been greatly speeded up because the coupling can be assembled and disassembled so easily.

. . . Circle No. 157



OLIVER



JUST SECONDS SEPARATE THESE PICTURES!

With dig-and-dump speed like this, figure the *extra* income that's yours from a rapid-cycling Oliver 770 tractor with No. 70 backhoe and 778 loader!

Whether you are grubbing out heavy-rooted stumps here...doing production trenching...or handling 101 other backhoe jobs, you capitalize on more modern tractor design with highest engine and hydraulic power to get stepped-up job production.

Note the easy job *this* operator has of it—how all controls are conveniently in hand, *in his lap*. No time-wasting long reaches; operation is finger-tip simple, the *contiring* Oliver way.

Oliver gives you three great new wheel tractor models each a master for easy mobility, exceptionally wide work scope and *all* the advantages that put more job contracts into your pocket!

Job-Test These Olivers Now!

NEW OLIVER 550—an all-purpose, versatile, budget-priced tractor of high-income ability. Gas or diesel. 558 loader capacity is 12 cu. ft....works with all mounted equipment, 70 backhoe and 3-point hitch tools.

OLIVER 770—a top-speed performer in its popular-size class; today's biggest value. Mounts ¾-yd. loader; is available with "Reverse-O-Torc" instant, finger-tip reversing; backhoe buckets from 12″ to 36″. Gas or diesel.

OLIVER 880—the big-production, heavy-duty loader or backhoe. Loads ultrafast with 1-cu.-yd. loader and "Reverse-O-Torc" control. Backhoe gives you fast, deep digging just like the big rigs at a fraction of the price! Gas or diesel.

T23-7

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Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio
a complete line of industrial wheel and crawler tractors and matched allied equipment

TELL ME MORE...give me full details on the Oliver model I have checked:

☐ Oliver 550 ☐ Oliver 770 ☐ Oliver 880
☐ I want a job demonstration, please.

Name.....Position.....

Address.....City.....Zone.....State.....

Lima 1250 3½-yd. Shovel nears end of million-and-a-quarter-yd. excavating job on highway reconstruction project near Knapp, Wis.

"LIMA 1250 moves half million yd. of rock—at 270-300 yd. hourly!"

says Lawrence Gerke, Wisconsin contractor

The job was tough, the schedule tight. "In only 2 miles," says contractor Lawrence Gerke, of Merrill, Wis., "we had to excavate a million and a quarter yd. . . . almost half of it rock!"

High performance, low maintenance

The project involved reconstruction on U. S. Interstate 94 near Knapp, Wis. Gerke needed a high performance machine with low maintenance requirements. He says, ". . . After considerable analysis of equipment, we purchased a Lima Type 1250 for rock excavating. In many cases no blasting was done. Yet, working in this material, the Lima constantly averaged 270 to 300 yd. per hour. When shovel work was completed, the 1250 was easily converted in the field to a dragline."

The crawler-mounted Type 1250 has turned in outstanding performances everywhere as a 3½-yd. shovel, 85-ton crane, and variable dragline.

Air-controlled precision

Main operating and auxiliary functions are air-controlled for smooth, precision performance at full capacity operation. Choice of diesel engine or electric motor with torque converter.

Other features and available equipment include: Independent propel, extra-high-speed hoist attachment, third drum, power reversing hoist drum, two types of rigid and folding gantries. The LIMA Type 1250 can be knocked down to units of less than 60,000 pounds for haulage.

Whatever your job, there's a Lima type and size exacty right—½ to 6-cu. yd. shovels, cranes to 110 tons, draglines variable. Learn now why so many contractors agree with Lawrence Gerke when he says, "We are completely satisfied with the operation of our Lima." See your nearby Lima distributor or write to us.

LIMA Shovel Distributors

Our Seattle Office, 1932 First Avenue South, Seattle 4, Washington; **Our La Mirada Office,** 14120 E. Rosecrans Ave., La Mirada, California; **Feenaughty Machinery Co.,** 112 S.E. Belmont Street, Portland 14, Oregon; **Modern Machinery Co.,** 4412 Trent Avenue, Spokane 10, Washington; **N. C. Ribble Co.,** 1304 North Fourth Street, Albuquerque, New Mexico; **Bay Cities Equipment, Inc.,** 2792 Cypress Street, Oakland 7, California; **Bay Cities Equipment, Inc.,** 1178 West San Carlos Street, San Jose, California; **McGaraghan Supply Company,** 529 Broadway, Eureka, California; **Evans Engine & Equipment Company,** 4300–11th Avenue, Northwest, Seattle, Washington; **Smith Booth Usher Company,** 2200 S. San Gabriel River Parkway, Los Angeles 54, California; **Evans Engine & Equipment Co., Inc.,** Post Road—Box 894, Anchorage, Alaska; **Faris-Moritz Equipment Co.,** 5790 Colorado Blvd., Denver, Colorado; **Shasta Truck & Equipment Sales,** South 99 Highway, Redding, California; **Reno Equipment Sales Company,** 1510 West Fourth Street, Reno, Nevada; **Western Machinery Company,** 820 North 17th Avenue, Phoenix, Arizona; **Western Machinery Company,** 1111 West St. Mary's Road, Tucson, Arizona; **Western Machinery Company,** 2300 South Main Street, Salt Lake City 15, Utah; **Western Machinery Company,** P.O. Box 197, 590 West 19th Street, Idaho Falls, Idaho

LIMA Construction Equipment Division, Lima, Ohio
BALDWIN · LIMA · HAMILTON 5933

. . . for more details, circle No. 52 on Reader Service Postcard

EMSA chapter notes

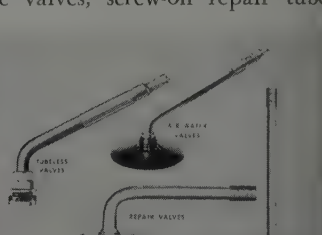
SEVERAL new officers were chosen at the recent meeting of the Bay Area Chapter of the Equipment Maintenance Supervisors Association. The new officers are: President—Howard Gold of Buran Equipment Co.; first vice-president—Gino Giampoli of Piombo Construction Co.; second vice-president—George Marcel.

Forty members attended the last meeting to hear Ed Poole of Waukesha Pacific Co. speak on preventive maintenance of internal combustion engines.

Line of tire valves

A COMPLETE LINE of tube and tubeless tire valves for off-the-road equipment has been announced by the Dill Manufacturing Company.

The line includes rubber base type valves, screw-on repair tube



valves, spuds for tubes, air-water valves, tubeless valves, and a complete group of valve extensions for rubber base or screw-on repair valves.

More than sixty different sizes are available among the various categories.

. . . Circle No. 15

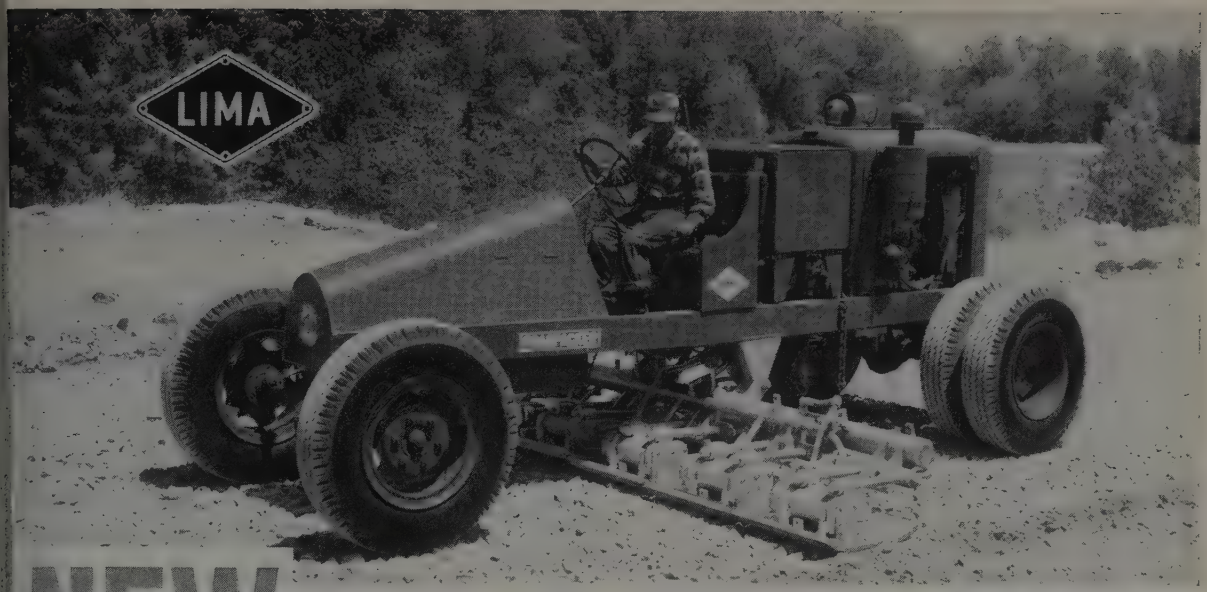
Engine reconditioning

WHAT is the proper way of obtaining positive initial valve seating when reconditioning a diesel engine? What is the maximum clearance allowable between a re-machined top groove and a new "wide" top piston ring? What is the maximum diameter wear limit for a cylinder liner before it must be replaced?

These questions and others are answered in a new eight-page booklet, "Money Saving Hints on Engine Reconditioning," just released by Caterpillar Tractor Co.

Tips on various operations which are necessary in reconditioning engines are also offered in the book

. . . Circle No.



NEW LIMA ROADPACKER MODEL D

Compacts Fast, Wide and Deep on Macadam, Gravel, Crushed Rock, Sand, Soil Cement and Stabilized Bases

SAVE WITH SINGLE COURSE CONSTRUCTION

ma Roadpackers meet the challenge no other vibratory compactor gives u so many cost-saving job-speeding tures . . . the reason why Lima adpackers are preferred by contrac- 's throughout the world for fast oduction on highway and airport nstruction jobs.

mpare these profit-making features!

Heavy Vibrators

437 pound vibrators deliver earth-king vibrations for deep, uniform nsities. Vibrator units are completely led—no external moving parts. rators are self-lubricated and need daily maintenance. Required den-es are quickly achieved. Macadam k is tightly keyed, with screenings rated into voids in only three appli-ions on most jobs. Compacts up to tons per hour.

Infinite Speeds

feet per minute to 30 miles per hour! A fluid motor propels the machine while compacting. A dial selector gives compaction speeds to match any job including new high production requirements within a broad range of 20 to 95 feet per minute. Roadpacker can be anywhere on the job at a moments notice. Heavy duty transmission provides fast highway travel speeds to next job.

One Lever Instant Reversing

Compacts forward or reverse with one lever control—no gear shifts—no declutching—no stopping. With the Lima Roadpacker you have no lost time and no depression in the material being compacted when machine is reversed.

Variable Working Widths

End shoes fold back for a selection of 4, 5 or 6 shoe working widths. Easily folded by the operator alone, the Roadpacker carries unused shoes ready for wider working widths at any time. Folded end shoes permit Roadpacker to travel over highway.

Controls Up Front

Roadpacker controls are all grouped at operator's seat—engine gages and controls are mounted on dash panel. Foot accelerator in addition to hand throttle provides natural roading of Roadpacker.

Widener Attachment

Extension arm works shoes in a widening trench to 11" below the existing pavement. Quickly adapted to various width widening work; replaces trench rollers.

These are only a few of the advantages incorporated into the new rugged Lima Roadpacker, Model D. For complete information, see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

Equipment Sales Company, 1510 W. 4th Street, Reno, Nevada; **Feenaughty Machinery Company,** 112 S. E. Belmont Street, Portland 14, Oregon; **Evans ne & Equipment Company,** 4300 11th Avenue, N. W., Seattle 7, Washington; **Bay Cities Equipment, Inc.,** 2792 Cypress Street, Oakland 7, California; **Cities Equipment, Inc.,** 1178 West San Carlos Street, San Jose, California; **N. C. Ribble Company,** 1304 North Fourth Street, Albuquerque, New Mexico; **rn Machinery Company, Inc.,** East 4412 Trent Avenue, Spokane 10, Washington; **Shasta Truck and Equipment Sales,** South 99 Highway, Redding, California; **ern Machinery Company,** 820 North 17th Avenue, Phoenix, Arizona; **Western Machinery Company,** 1111 West St. Mary's Road, Tucson, Arizona; **s Engine & Equipment Co., Inc.,** Post Road—Box 894, Anchorage, Alaska; **Faris-Moritz Equipment Company,** 5790 Colorado Blvd., Denver, Colorado; **ern Machinery Company,** 2300 South Main Street, Salt Lake City 15, Utah; **Western Machinery Company,** P.O. Box 197, 590 West 19th Street, Idaho Falls, ; **Smith Booth Usher Company,** 2230 S. San Gabriel River Parkway, Los Angeles 54, California

LIMA Construction Equipment Division, Lima, Ohio

BALDWIN · LIMA · HAMILTON

5948

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

NEW LITERATURE

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

New catalog on A-C diesel

Design, construction and mechanical features of two new power plants—the 21000 and the 16000 diesel engines—are described in a 16-page catalog available from the Engine-Materials Handling Division of **Allis-Chalmers Mfg. Co.** The catalog, complete with many illustrations and charts, describes the new units and shows how they can fit into every field of power application. In a 4-page bulletin the Construction Machinery Division of the company describes the operating and mechanical characteristics of the 21,000 engine as the power plant for its HD-21 diesel crawler tractor. *. . . Circle No. 160*

Folder on Cleveland trenchers

Features of the three new Cleveland J trenchers introduced earlier this year are described in a 4-page folder released by the **Cleveland Trencher Co.** The text of the folder, aided by a series of simplified illustrations, describes the new design and construction features, pointing out how these features improve the operation of the trenchers. A quick comparison of capacity, specifications and dimensions of the models is provided.

. . . Circle No. 161

Catalog of spraying equipment

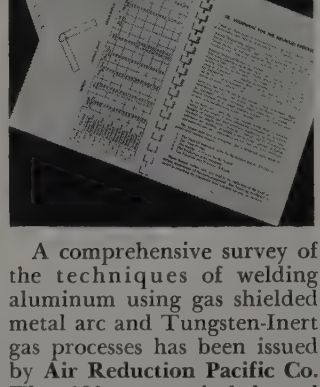
Illustrating and describing the latest equipment for applying protective coatings, mastics and insulating material, **Gray Company, Inc.**, has a new catalog. This bulletin features air power pumping equipment that automatically adjusts operating speeds to the load. Other equipment shown in the catalog includes pumps of special design for handling heavy viscous material. *. . . Circle No. 162*

Twin engine crawler

Features, operations and component parts of the Euclid TC-12 twin engine crawler tractor are described in a colorful, profusely illustrated 24-page booklet, recently issued by **Euclid Division of General Motors.** The catalog contains condensed specifications and performance chart in relation to attachments that are available for use with single and double cable controlled units. The booklet is well illustrated with photographs from various types of operations, cutaway and sectional views and drawings that explain twin power application, Torqmatic Drive, hydraulic track tensioning and other designs of the tractor.

. . . Circle No. 163

Aluminum welding manual



A comprehensive survey of the techniques of welding aluminum using gas shielded metal arc and Tungsten-Inert gas processes has been issued by **Air Reduction Pacific Co.** The 120-page spiral bound book is entitled "Aircomatic and Heliwelding of Aluminum." Major topics covered include: weldability of aluminum and its alloys, definitions and technical discussions of the two welding processes, selection of the proper process for certain job applications, descriptions of manual and automatic equipment, welding power supplies, and safety practices. The book is illustrated with 100 photographs, charts and detailed diagrams of welding equipment and techniques.

. . . Circle No. 164

Eimco booklet on tractors

A 16-page booklet coveri the Eimco 105 series of tr tors and tractor units has been leased by **The Eimco Corp.** T book illustrates all of the un in this line including the tract dozer and front-end loader. Spe fications are provided for ea unit, and a feature of the bookl is a description of Eimco's "U drive" transmission.

. . . Circle No

Joint compound for jet runways

A cold-applied sealing compou designed specifically for joints portland cement concrete expos to the action of jet aircraft is c ered in a 4-page bulletin issued the **Presstite Division, Americ Marietta Co.** The literature d scribes the new material (Pressti #55-MIL) as one which resists j blast and fuel, cures quickly a dries within 60 min. The bullet also includes information on a n curing tape known as Conseal.

. . . Circle No.

New bulletin on Cat scraper

In a 2-color booklet **Caterpill Tractor Co.** describes the featu and production capacities of t new DW21 and No. 470 tract and scraper units. The 8-pa booklet outlines such features the higher power, dry type a cleaner and increased capaci Other features are described in t booklet which is entitled "Out front for '59." *. . . Circle No.*

Crab tractors in action

Action photographs and pictu of its various attachments featu the brochure made available on t Napco Crab tractor by **Napco dustries, Inc.** This is a machi with 4-wheel drive and 4-wh steering and other modern featu of design to improve production

. . . Circle No.

Grout problems discussed

The problem of shrinkage whi is the principal cause of grout fa ure is described in a 16-page b letin just released by **Master Buil ers Co.** The booklet starts by

scribing the problems resulting from shrinkage and then reviews in detail the non-shrink grouting material called Embeco. The booklet goes into considerable detail on methods of grouting and placing grout. Most of these applications are in connection with the installation of heavy machinery.

. . . Circle No. 169

Gravel road manual

A 36-page, pocket-size manual, titled "Maintenance Tips for Unpaved Roads," has been issued by **Calcium Chloride Institute.** Booklet discusses practical maintenance operations in spring, summer and fall provides instructions on shaping and crown, application of new material, use of calcium chloride, etc. Also included are various useful charts and data.

. . . Circle No. 170

Bulletin on new lubricant

A 4-page bulletin featuring several lubrication selector charts has been released by **The Alpha-Molykote Corp.** The chart evaluates each material in the Molykote line under conditions of temperature, environment, method of application and operating conditions.

. . . Circle No. 171

Specs on Heltzel batching plant

Set-up procedures showing the eight simple steps required for its "Unitized" combination batching plant have been described in a 4-page bulletin by **Heltzel Steel Form & Iron Co.** The bulletin also includes drawings showing principal dimensions of the plant.

. . . Circle No. 172

Guide for dipper teeth

A 16-page illustrated catalog lists more than 400 tooth point and tooth adapter models now available from **American Brake Shoe Co.** for all makes of shovels and back hoes. It represents a reference work for shovel maintenance covering the Simplex 2-part tooth.

. . . Circle No. 173

Match wire rope to the job

A service bulletin has been released by the **Leschen Wire Rope Division, R. K. Porter Co., Inc.,** providing recommendations for selecting the best wire rope for use on all types of equipment, from aerial tramways to winches. This 4-page bulletin points out that two or three choices are often available depending on special circumstances.

. . . Circle No. 174

Inserts for concrete

A leaflet by **Superior Concrete Accessories, Inc.,** describes and illustrates their new threaded inserts representing a convenient system for anchoring sprinkler systems and other units to concrete.

. . . Circle No. 175

Catalog on IH skid shovel

Features of the International Drott TD-15 skid-shovel are well illustrated in a 16-page, 2-color catalog issued by **International Harvester Co.** On-the-job photographs are featured showing details of using the exclusive 4-in-1 bucket available on this one tractor loader.

. . . Circle No. 176

Bulletin on line markers

Illustrating and describing its complete line of traffic line markers, an 8-page catalog has been released by **MB Corp.** The catalog describes the general features of each machine and then provides a picture, description and specifications for each of the models.

. . . Circle No. 177

Reviews Barber-Greene line

An illustrated folder showing the various principal units in its line of machines for highway work has been announced by **Barber-Greene Co.** Each machine is illustrated and described.

. . . Circle No. 178

Replacement parts for tractors

In a 4-page brochure the **Columbia Steel Casting Co.** illustrates and describes the replacement parts it produces for many makes of tractors. The parts illustrated include track shoes, dozer blades and sprocket rims.

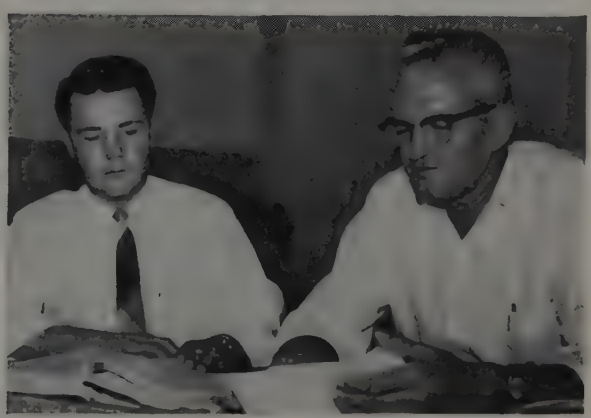
. . . Circle No. 179

Data on Trojan shoel

A 2-page leaflet covers the specifications of the Model 304 Trojan tractor shovel of **Yale & Towne Manufacturing Co.** The bulletin lists standard and optional equipment for this new model which includes three interchangeable buckets.

. . . Circle No. 180

a mountain in two. Start of the Malta-Grass Range
y. 1,600,000 cubic yards of earth moved, one of the larg-
le cuts in the history of Montana.



Forest J. Paulson, C.I.T. Representative and M. H. Cherf, Business Manager of the joint venture, discuss the project in the Ephrata, Washington, office of Cherf Bros., Inc., & Sandkay Contractors, Inc.

NEW EQUIPMENT

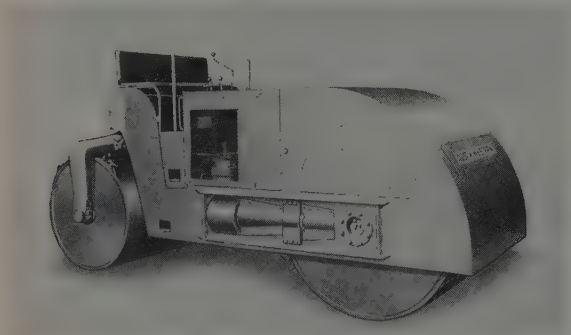
Obtain more information on these new developments in construction equipment by circling the corresponding numbers on reply postcard.

Supplementing an article last month titled "Compaction of Asphalt Paving," *Western Construction* presented a review of modern rolling equipment for that purpose. Products of thirteen manufacturers were described and illustrated starting on page 96 of the June Highway Issue.

Information from five additional manufacturers was not received in time to be included in that review. These five items follow.—Editor.

Austin-Western

A new series of steel wheel rollers is thoroughly described and illustrated in an 8-page booklet published by the manufacturer, **Austin-Western,** a division of Baldwin-Lima-Hamilton. The tandem models

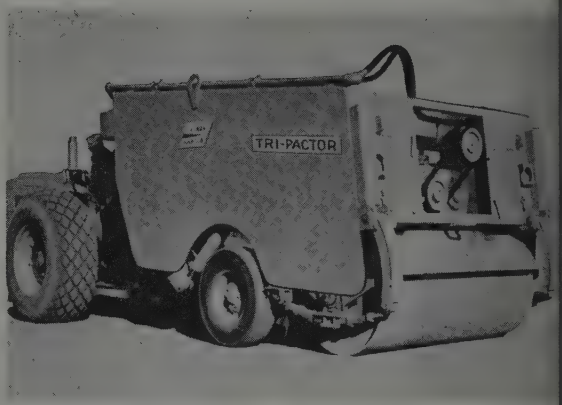


(see photo) are variable in weight and are made in 5-8, 8-12, and 10-14-ton sizes. The variable weight 3-wheel models come in 8-11, 10-12, and 12-14-ton sizes. A large majority of parts are interchangeable between the tandem and 3-wheel types, an advantage to owners of both. The booklet contains photos of job scenes, condensed specifications on all models, and factual descriptions of all major features. The company was the first to manufacture motor rollers.

. . . Circle No. 181

Seaman-Gunnison

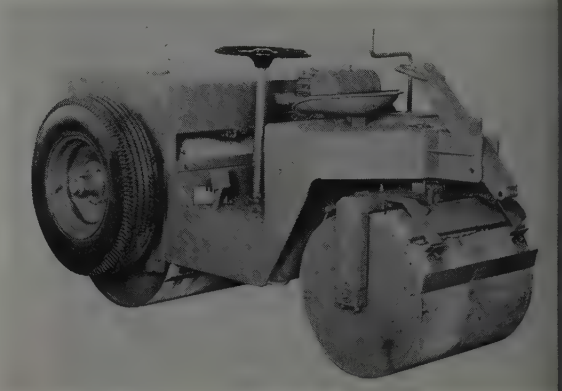
Three types of compaction, pneumatic, smooth steel rolling, and vibratory impact, are delivered by one unit, the new Tri-Pactor, Model 7-19 TRI, manufactured by **Seaman-Gunnison Corp.** Composed of a smooth steel roll, an 8-wheel pneumatic roll, a vibratory element, and a prime mover, the unit weighs 7 tons empty and 19 tons fully loaded. It is capable of delivering loading intensities up to 50 tons surface pressure. Compaction elements can be used in combination or separately. Vibration frequency can be adjusted from 800 to 1,400 vpm. Prime mover is



integral with unit, available with diesel or gasoline engine, and is interchangeable with other company equipment. The machine is 72 in. wide, and can turn 180 deg. in an 18-ft. roadway. *. . . Circle No. 18*

C. H. & E.

The **C. H. & E. Mfg. Co.** builds small rollers in a range from 1½ to 4 tons. Illustrated is a portable tandem model with a towing tongue. When moving the roller from job to job the tongue is attached to



the back of the truck, and the rear rubber tired wheels are lowered. The model pictured has a Wisconsin 1-cylinder 8-hp. air cooled engine with electric starting. Net weight unballasted is 3,300 lb. and gross weight with water ballast is 5,000 lb. The machine is 50 in. high, 72 in. wide and 92 in. long. It has a turning radius of 12 ft. Electric brakes are available as optional equipment. *. . . Circle No. 18*

Chester

A rubber-tired, 9-wheel roller which compacts to 11 tons is the newest model produced by **Chester**

HENRY'S *Power Principle*

MEANS MORE JOB PROFIT

*HENRY'S POWER PRINCIPLE is the skillful and unique application of basic leverage principles.

The HENRY MARK IV increases the angle between the dipper stick and the crowd cylinder — increases your profits with maximum digging power.

Other Backhoes — Henry Mark IV

MARK IV

Designed for more power where you need it most . . . at the bottom of the hole.

TS-500

HENRY TS-500, working companion of HENRY MARK IV, designed with POWER PRINCIPLE — increases profits through greater operating efficiency.

HENRY® MANUFACTURING COMPANY, INC.
Topeka, Kansas

HENRY Equipment is sold and serviced in this area by:

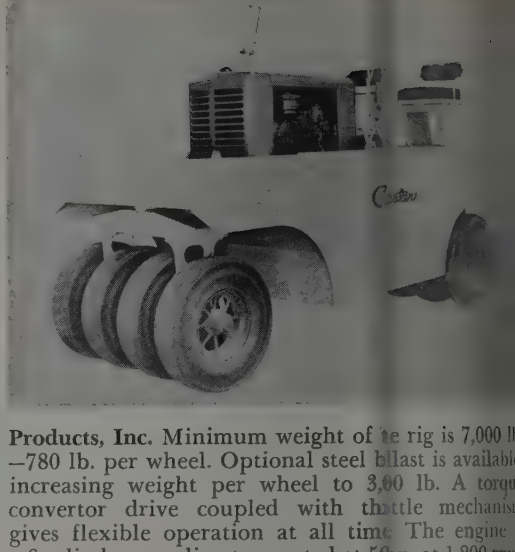
The Parker Company
Denver, Colorado

Mitchell, Lewis & Staver
Portland, Oregon
Branches: Spokane, Washington
Caldwell, Idaho

Ferris-Killion Implement Company
Great Falls, Montana

The H. C. Shaw Company
Stockton, California
Branches: Santa Ana, California
Fresno, California
Phoenix, Arizona

. . . for more details, circle No. 58 on Reader Service Postcard

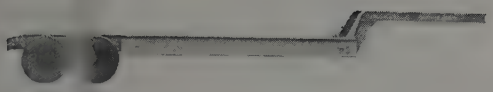


Products, Inc. Minimum weight of the rig is 7,000 l —780 lb. per wheel. Optional steel ballast is availabl increasing weight per wheel to 3,00 lb. A torqu convertor drive coupled with thttle mechanis gives flexible operation at all time The engine a 6-cylinder, gasoline type rated at 50hp. at 1,200 rp Power steering is incorporated in a single leve located between dual seats for maximum operat visibility. Hydraulic brakes and 6-plyrayon reinforce tires are standard. . . . *Circle No. 1*

Holt

A line of rollers with unusual center point steerin which permits much shorter turnin radius for clo quarters is available from **Holt Equipment, Inc.** O

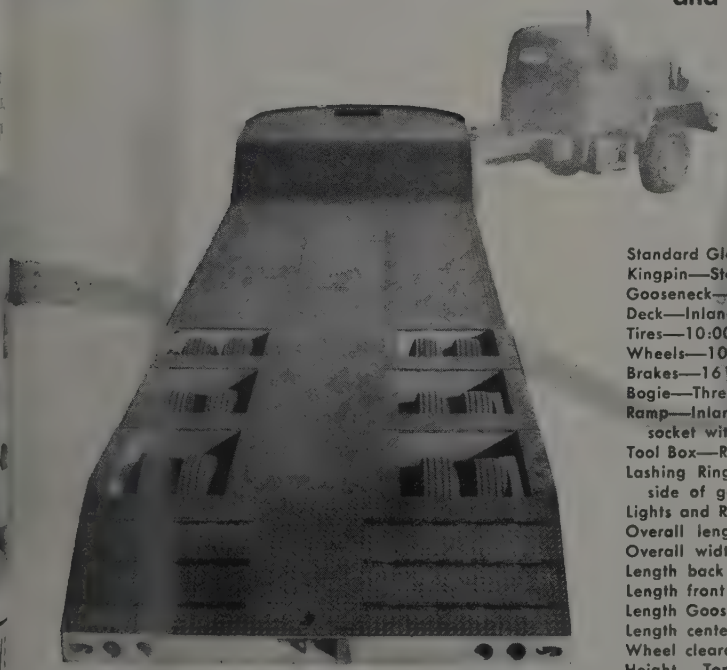
HE-MAN HAULING



8 TON MODEL 8 - LT - 25

8 TON MODEL 35-LT-KRS

The new Miller & Smith 50-ton, 3-axle Lo-Boy Trailer is the answer to the contractor's needs of adequate transport equipment for hauling heavy machinery from job to job, as well as on the job-site. High tensile alloy steel used in the frame members makes it possible to arrive at the high "pay-load to trailer-weight" ratio of 5 to 1. The 3 axle spring-mounted bogie provides ample flotation to meet road and bridge standard loadings. The long, drop-center deck facilitates distribution of load over trailer and tractor axles.



50 TON MODEL 184-TA-50L

SPECIFICATIONS AND DIMENSIONS

Standard Glad Hands and Jumper Cable Socket.
Kingpin—Standard steel heat treated.
Gooseneck—Full width - Decked with Inland 4-way Deck Plate.
Deck—Inland 4-way Deck Plate.
Tires—10:00x20 12-ply Nylon.
Wheels—10 Hole Budd.
Brakes—16½x7 with individual air cylinders.
Bogie—Three Axel Spring Suspension.
Ramp—Inland 4-way deck plate - cleated - recessed tow bar socket with pin in center rear frame member at toe of ramp.
Tool Box—Recessed in top of Gooseneck at front.
Lashing Rings—D-Type-Swinging Type 6 each side - one each side of gooseneck.
Lights and Reflectors—ICC specifications.

Overall length	43',10"
Overall width	9',6"
Length back of gooseneck to front wheel well	16',6"
Length front wheel well to back of trailer	15',1"
Length Gooseneck deck	8',9"
Length center of kingpin to center of Bogie	32',3"
Wheel clearance from center kingpin	76"
Height - Top of loading deck to ground	36½"
Height - Top of gooseneck to ground	59½"
Clearance - Frame Bottom	18½"
Height - 5th Wheel Plate to ground	51"
Height - Gooseneck Above Loading Deck	23"

Miller & Smith
Mfg. Co., Inc.

500 PHOENIX AVE., NW — STATION B, BOX 6007
ALBUQUERQUE, NEW MEXICO

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

roll follows the other exactly for clear work on ins or outside turns and eliminates lap marks at all tim The largest units are suitable for laying blacktop street patch work. All models have tilt-top trail available which enable one man to quickly load unload. *. . . Circle No.*

2-yd. loader has 4-wheel-drive

Improved lift arm geometry and simplified contr are featured in a 2-yd., 4-wheel-drive front-end loa called Lorain Moto-Loader announced by **The Th Shovel Co.** The unit is available with a 105-h gasoline engine or a 110-hp. diesel. It offers one-fo control of travel direction and speed, excellent wo

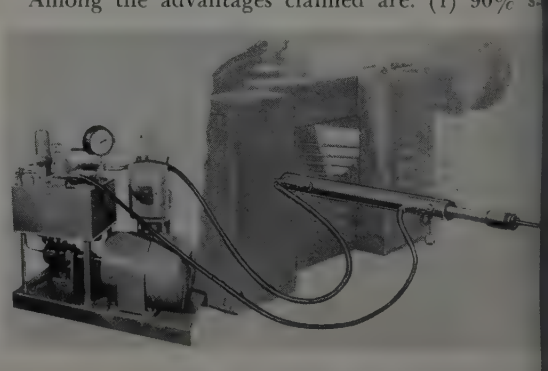
P867

visibility, planetary wheel drive, power steeri torque converter and fully automatic transmission, well as 4-wheel hydraulic power booster brakes. lift arm design eliminates hazardous "scissor actio and the low center of gravity gives the unit an unusu balance for maximum stability to dig and carry hea loads. The new machine designated Lorain ML-1 replaces the company's Moto-Loader Model ML-1 and is the first piece of equipment other than pow shovels and cranes to carry the trade name Lorain. *. . . Circle No.*

Stressing system is fast and light

Using a new system, the No. X349 Center-H Simplex Single-Strand Tensioning Unit has be added to the pre-stressing and post-tensioning equi ment made by **Templeton, Kenly & Co.** Consisti basically of a hydraulic pump and center hole ra the maker states the new unit features a lower co faster operating, lighter weight tensioning syste With this system, the entire time to tension one cab on a 300-ft. bed is about one minute.

Among the advantages claimed are: (1) 90% s



...ow..clam-action 4-in-1 PLUS values

...NEW TD-6 and TD-9 crawlers!

...6-cylinder diesel smoothness ...ower wallop! Both the new ...nd TD-9 Four-in-One's are pow- ...ith the millions-of-hours-proven, ...starting, 6-cylinder International ...2 diesel. Naturally-aspirated in ...-6, it produces 55 net engine hp; ...harged in the TD-9, it delivers ... engine hp!

...ob-getting efficiency! Both the ...D-6 and TD-9 Four-in-One's have ...ed track length, for new tough- ...ability and flotation. Both are ... with new speeds for greater ... job capacity. Both have the ...transfer efficiency of new full- ...ntered metal engine clutches. ... both the new TD-6 and TD-9 ...xclusive vented track-roller and ...hafts, assuring positive seal pro- ...n from over-lubrication. Big ...increased lube capacity shells ...e 500-hr. track-roller greasing in- ...!

...the selector lever! Prove ver- ... unlimited of exclusive 4-in-1 as ...hovel; space-saving, bottom- ...ng clamshell; full-sized bulldozer; ...ose-accurate "carry-type scraper." ...p how many tens of thousands ...ars a new TD-6 or TD-9 four-in- ...n save you, doubling for one lim- ...ty rig after another! Measure ...us value of exclusive shock- ...wing Hydro-Spring. See your ...ational Drott Distributor for a ...stration!

...ional Harvester Company, Chicago 1, Illinois ...anufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL®
DROTT®

New 1⅛ cu. yd. International Drott TD-6 Four-in-One. New TD-9 Four-in-One has 1½ cu. yd. bucket capacity.

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

ings on equipment cost. One small capacity jack replaces four heavy capacity jacks; (2) bed design is more economical, with only one header required; (3) with the single-strand pulling method the complete tensioning pull is done in the same length of time as the initial 1,000-lb. pull when heavy-duty jacks are used; and (4) elimination of movement of heavy jacks from bed to bed. *. . . Circle No. 187*

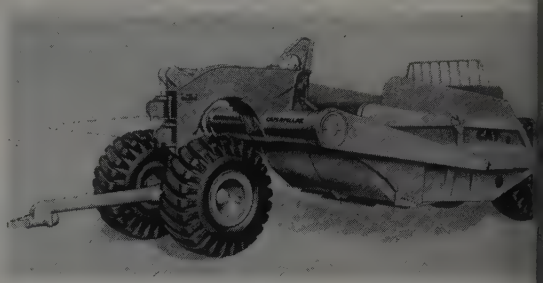
Portable 4-compartment aggregate bin

Designed especially to handle sand and coarse aggregate for hot mix asphalt plants, **Standard Steel Corp.** announces a new 4-compartment portable bin with a capacity of 80 tons and a feed that will handle up to 250 tons per hour. Each of the two forward compartments, generally used for sand, have independent belt

feeders discharging on the main conveyor belt. The coarse aggregate discharges to the same belt through adjustable gates at the bottom of the other two bins. The portable features have been designed to appeal directly to highway contractors and this feeder bin has been developed to go with Standard's portable asphalt plants and dust collecting equipment.
. . . Circle No. 188

Cat's new scraper has increased capac

Designated the No. 463 Series C Scraper, which be used with either D8 or D9 tractors without mod cation, **Caterpillar Tractor Co.** offers a unit with

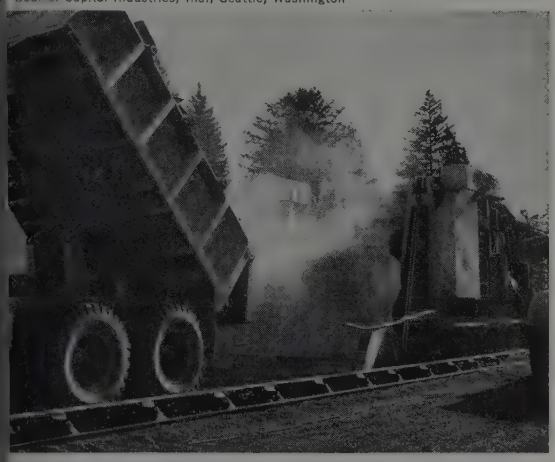


creased capacity, greater flotation and more dura construction. Its struck capacity has been increa from 18 to 22 cu. yd. compared to the previous mo and the corresponding heaped capacity exten to 29 cu. yd. as compared to 25. The increased fl tion has been accomplished by using wide base t less tires of 26.5 x 25 on front wheels, and 29.5 x on rear.

The structural improvements include two new s porting ribs which strengthen the welds between bowl sides and cutting edge supports and new inte braces. The push block is stronger and more rig attached and the surrounding area redesigned for ditional strength. By raising the apron pivots ab 6 in. the opening height has been increased and closing action improved. *. . . Circle No.*

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

Bodies: Capital Industries, Inc., Seattle, Washington



Brawn for Road-Builders. Bottoms up—and 20 tons of ...asive rock slide into the base of the new Seattle-...oma Freeway. To take this grinding punishment and ...ease payloads, smart contractors speed the West's ...way construction program with lightweight truck ...ies of special high-strength steels from USS.

Contractor: George Pollock Co., Sacramento, Calif., Steelwork: American Bridge Div., USS.

New Lift for Old Bridges. A revolutionary new construction idea—a "piggyback" bridge to carry an existing railroad bridge over heavily-traveled Highway 40 at Auburn, California. The new bridge of USS Structural Steel replaces supporting towers and provides a 240′ span for uninterrupted traffic flow on the widened highway below.

Tubes for Torrents. In National Parks, in the rugged ...ky Mountains, Eaton Metal Products Co., Billings, ...tana, furnished miles of pipe made from USS Gal-...zed Culvert Sheets to divert snow water and prevent ...houts of roads and campsites. These dependable, ...cost, quickly-installed steel pipes help provide easier ...ss to our rapidly expanding Western park system.

Steelwork: Madison Builders Inc., Los Angeles, California

New Treat for Travelers. An inviting service station Travel Center at Victorville, California, offers weary motorists a welcome respite from the road. This attractive steel unit is a combination lounge, information and refreshment center. Built to last—of USS Steel structurals and sheets—these roadside retreats are handsome, long-term lures to land more business from Western travelers.

ALUMINUM transit concrete mixers, first in the U.S., were placed in service by Central Pre-Mix Concrete Co., Spokane, recently. Mixers were developed jointly by Construction Machinery Co., and Kaiser Aluminum and Chemical Corp., and built by CMC. Mixers are 7-yd. CMC Transcretes mounted on International truck chassis. They weigh one-third less than steel models of same size. *. . . Circle No. 190*

Permanent concrete adhesive

New concrete can be bonded to old with an adhesive known as Concresive marketed by **Adhesive Engineering.** The material is available in two forms. Concresive No. 1 is a brush on liquid which can be mixed with sand or aggregate

to form a high strength mortar. Concresive No. 2 is a paste to fill voids in rough surfaces when bonding solid materials together. Uses include adding extra thickness to highway or airport slabs, bonding curbs to pavements, making featheredged patches on highways, and other similar applications. The adhesive can also be used to join concrete to asphalt, stone, brick, glass, metal, wood and other materials.

. . . Circle No. 191

Rule figures volumes for cut and fill

An instrument to speed calculation of cut and fill volumes has been introduced by **Engineering and Marketing Associates, Inc.** Called the Avol Rule, it measures composite depth of cut along vertical lines drawn half an inch apart, and shows pre-calculated volume. This method replaces the old "average end areas" method, and in tests has saved about six man-hours of labor per mile in computations.

. . . Circle No. 192

Wood chipper with more power

With a gasoline engine that produces 132 hp. at 2,400 rpm., an improved model of its wood chipper has now been made available by **Weed Control Service, Inc.** Designed for the same function as its earlier models, the unit reduces brush and forest slash to wood

chips which are disposed of by blower. The added power has been introduced to take care of the sudden loads resulting from the effect of feeding solid material against the knives. Since the engine must absorb these load shocks to maintain speed of the loader the Hercules 3-cylinder power unit has been introduced. *. . . Circle No. 193*

BETTER DAM MACHINE

Doubling in dragline and concrete bucket service, this Marion 362 set a fast work pace on a dam in Wisconsin. Its job: to help build a new dam and rip out an old one. The project involved 14,000 yards of concrete.

The Marion handled a 1½ yard drag bucket for excavation and a 1 yard bucket for concrete, using a 70 foot boom.

Smooth, fast-acting Marionair control and self-cleaning crawlers that resist clogging in the worst footing are among the many plus features of this and other sizes of Marion machines for contractors. See your nearest Marion Distributor for details.

You get

MORE *with* **MARION**

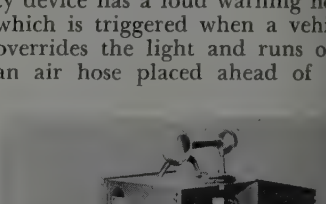
MARION POWER SHOVEL CO. MARION, OHIO

A Division of Universal Marion Corporation

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

Flasher unit has warning hor

Double protection against on coming traffic is given highwa crews by the Traffic Flasher Alar introduced by **Falcon Alarm C Inc.** In addition to the flashin red warning light, the Falcon saf ty device has a loud warning hor which is triggered when a vehicl overrides the light and runs ove an air hose placed ahead of th

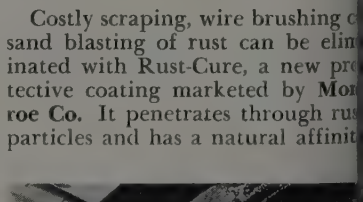


closed lane. The horn not onl warns the motorist to slow dow but also warns the crew allowin them time to get out of the wa Horn and flasher light are house in a portable metal container. Th assembly includes a standard ba tery which powers the flasher ligh and the horn operating mechanism Power for the horn is furnished b the replaceable can of Freon g under pressure. Storage for the a hose and extension wire is provide in a separate compartment.

. . . Circle No. 1

Protective coating penetrates rust

Costly scraping, wire brushing o sand blasting of rust can be elim inated with Rust-Cure, a new pr tective coating marketed by **Mo roe Co.** It penetrates through ru particles and has a natural affinit



to the metal surface beneath th rust. The material is ready to a ply by brush and can be thinne for spray application. It is avai able in clear or red aluminu green, gray and black colors.

. . . Circle No. 1

eavy duty sinker drill

Beavertail retainer and all-new ont head assembly are included the model CP-69 sinker drill eveloped by **Chicago Pneumatic ool Co.** Key element in the re-iner design is a rubber cushion hich eliminates retainer springs d increases contact between drill el and retainer collar. Front ad assembly is enclosed in a one-ece sleeve and can be rotated 0 deg. to put retainer latch in ost convenient position for oper-

. . . Circle No. 197

ternational introduces the line

With advanced styling, power d body design, **International arvester Co.** has introduced a new e of trucks with a gross weight

nge of 4,200 to 33,000 lb. Desig-ted the B-line, the trucks are ailable in 4 and 6-wheel and all-heel drive chassis powered with 6-linder or V-8 engines. A wide oice of designs are available, as e component options.

. . . Circle No. 198

rtable fuel storage tank

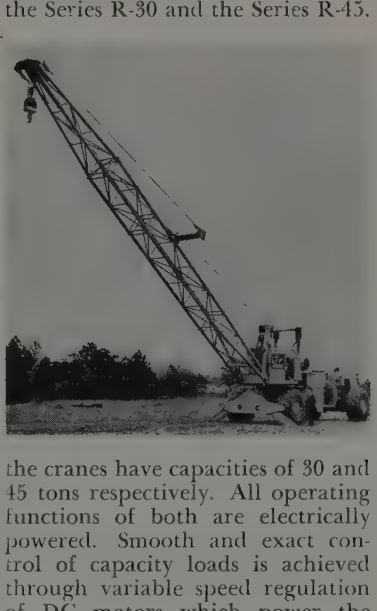
A fuel storage and dispensing sys-n suitable for any job and any rain which provides storage ca-

cities ranging from 5,000 gal. up-rd is announced by **Petroleum stems, Inc.** The storage plant can erected in 2 hr. A pilot model 30,000-gal. capacity has been in e for 2 years. Heart of the sys-m is a unitized pump and filler se assembly which can be quickly nnected to the storage tank.

. . . Circle No. 199

Electrically powered mobile cranes

Two mobile electric cranes which can set their own outriggers and be ready to lift capacity loads within 30 sec. have been announced by **R. G. LeTourneau, Inc.** Known as the Series R-30 and the Series R-45.

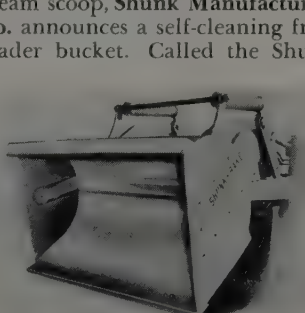


the cranes have capacities of 30 and 45 tons respectively. All operating functions of both are electrically powered. Smooth and exact control of capacity loads is achieved through variable speed regulation of DC motors which power the hook line and boom swing. Individually-operated electric-powered outriggers form a level lifting platform on varied terrain and are controlled from the operator's cab. Added load handling accuracy is provided by powered down-travel of the hook line and positive 360-deg. power control of the boom swing. There are no friction clutches to grab or slip, only smooth power application actuated through finger tip controls. Maintenance is minimized by the system of direct power application to components which eliminates problems associated with friction clutches, transmissions, and long gear trains.

. . . Circle No. 200

Front loader cleans itself

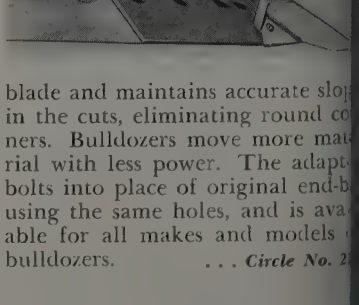
Using the principle of the ice-cream scoop, **Shunk Manufacturing Co.** announces a self-cleaning front loader bucket. Called the Shunk-



Baker Self-Cleaning Bucket the a... tachment can be furnished in 1½, 2 and 2¼-yd. capacity and interchangeable with rear-hing... buckets. Its obvious advantage increasing output when the un... is working in gumbo, muck, stick... clay or other heavy soils. As th... bucket dumps, the alloy stee... scraper blade cuts the materi... loose from the bucket interio... This permits the operator to mai... tain regular work cycles witho... the time consuming delays of clea... ing out the stuck materials. It al... relieves the machine from th... shocks resulting from dumping e... fort. The chain driven scraper ... spring loaded and is not subject t... damage by rocks. *. . . Circle No. 2...*

Puts sharp corners on bulldoze...

To put sharp corners on a bul... dozer blade, **H&L** announces a co... ner adapter with a Flexpin type ... tooth. Both adapter and point a... of forged high alloy steel. Th... point moves ahead of the doz...



blade and maintains accurate slo... in the cuts, eliminating round co... ners. Bulldozers move more mat... rial with less power. The adapt... bolts into place of original end-b... using the same holes, and is ava... able for all makes and models ... bulldozers. *. . . Circle No. 2...*

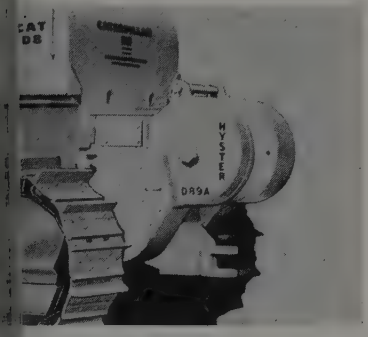
I-R adds to its rotary line

A new 250-cfm. unit has be... announced by **Ingersoll-Rand C...** in the line of Gyro-Flo compresso... The new unit will supercede t... Gyro-Flo 210, which has been ... the line for several years. With ... new compressor system, the Gy... Flo 250 will present nearly 20 ... more capacity than its predecesso... It is driven by a larger engine b... retains the 1,800-rpm. speed. T... fuel and air tanks are housed a... under lockable cover. A 12-vo... battery system provides fast sta... ing. Power is optional between t... General Motors diesel and a Con... nental gasoline engine. The unit ... available with 2 or 4-wheel mou... ings or without running gear.

. . . Circle No. 2...

wing winch for the new Cats

Including four new design improvements, a towing winch has been announced by **Hyster Co.** designed for installation on the new Caterpillar D8 and D9 tractors. These design improvements are (1) simplified gearing cut from special

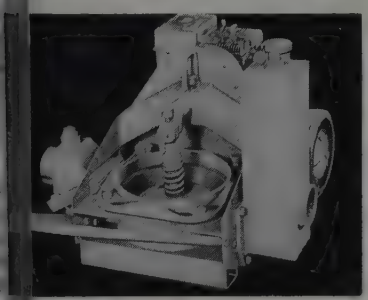


steel and heat treated for long service, (2) high speed reverse to reduce time required for pulling out stable, (3) easier to operate controls and (4) new clutch engagement timing to make shifting faster and smoother. In addition to installation on the new Series H Cat D8 tractor this can be installed on earlier D8s with serial numbers beginning with 8U and 15A, and can be installed on all D9 tractors.

. . . Circle No. 204

ong, light weight and ompact

design to provide strength with compactness to fit into cramped spaces and weight reduction for transportability, features the new line of diaphragm pumps offered

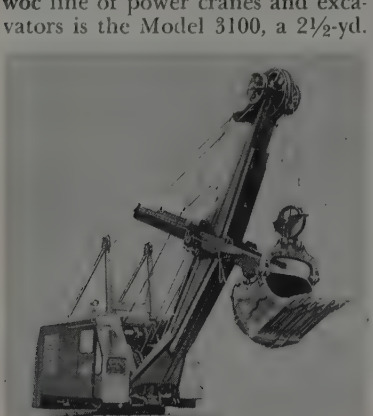


Barnes Mfg. Co. The line has a range of pumps with capacities from 1,500 to 6,000 gal. at 5-ft. lifts. The line will handle almost all drainage and de-watering applications with units of convenience and economy. All units have easily reversible discharge valves and seats that provide easy passage for forward solids. All models are available on wheels or skids, and with a variety of optional power provided.

. . . Circle No. 205

Manitowoc 2½-yd. shovel

Newest addition to the **Manitowoc** line of power cranes and excavators is the Model 3100, a 2½-yd.

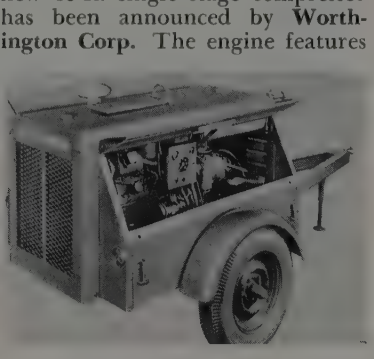


shovel which is easily converted to clamshell, back hoe, dragline or crane. Self-removable counterweight aids in weight and bulk stripdown and an overall outside width of only 11 ft., 1 in. maximum means the machine can be put on a standard flat car without extensive advance preparations or dismantling. Features include a 9½-in. diameter alloy steel kingpin, self-cleaning crawler drive, and simple jack adjustment of crawler treads. An optional accessory, which is especially convenient for steel setting or maneuvering in tight spots, is the independent swing. Forced ventilation and disc clutches are other features.

. . . Circle No. 206

Compressor features low speed engine

Based on a low engine speed, a new 85-ft. single stage compressor has been announced by **Worthington Corp.** The engine features



economy of operation and maintenance and reaches peak efficiency at only 1,800 rpm. which means reduced wear and longer engine life. The 168-hp. Continental gasoline engine has reserve capacity more than 50%. The unit perm discharge pressure settings from to 125 psi. and has been desig for heavy-duty operation, with isfactory performance on moder slopes. The wide track wheels a low center of gravity permit h speed towing. Dimensions are in. high, 61 in. wide and 121 long, including tow bar.

. . . Circle No.

New carriages for Hopto

New undercarriages have b announced for the model 200 H to backhoe, manufactured by **Badger Division** of **Warner Swa Co.** One is a new self-propel rubber mount featuring a 16 turning radius, 25-mph. speed a individually controlled hydrau outriggers. The Hopto backh with this undercarriage is now d ignated Model SPR. The ot model is a crawler mount desig for the same backhoe and featu a heavy-duty frame and coun balanced design to stabilize crawler mount. It has a speed 2 mph. Tracks are 17 in. wide a 9½ ft. long with a bearing press of 4.5 psi.

. . . Circle No.

andie Talkie" blocks erference

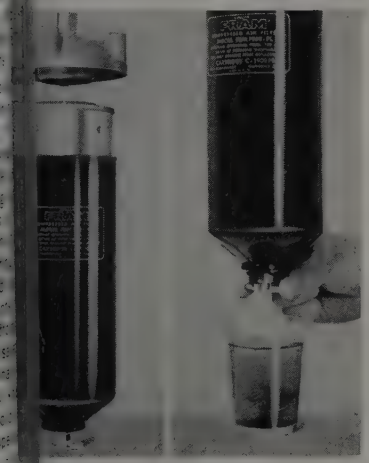
The first portable 2-way radio- one designed to block out an- ing interference caused by other io systems has been introduced Motorola, Inc. Referred to as "Private Line" radio the unit vides the same protection as the pany's portable and base sta- equipment. The unit works

tone coded squelch principle a transmitter generating an dible coded tone. Incoming sages are blocked from the re- er's circuit unless the coded is present.

. . . Circle No. 209

r to clean compressed air

emoving moisture, oil and con- nation, a new type compressed ilter operates on separation er than absorption. The unit been introduced by **Fram Corp.**



mulated water and oil can be ed off periodically, as shown, he cartridge is easily changed ever necessary. The unit is installed and can be used on nes with air pressures up to si.

. . . Circle No. 210

FOUR-YARD bucket attached to cableway brings concrete for bridge deck. Highline was set up to place steel bridge girders which were cantilivered out from hollow concrete piers, and welded.

SOUND POWERED phones transmit in tions to drum operator Kenneth J. N

Cableway speeds Oregon bridge jo

USE OF A 50-ton capacity cableway simplified erection of a 605-ft. bridge spanning the Rogue River at Grants Pass, Oregon. Bridge is composed of five welded steel plate girders resting on hollow concrete piers and supporting a 32-ft. concrete deck of 6-in. reinforced slab.

The $349,000 contract for the Oregon Highway Department was executed by Peter Kiewit Sons' Co., with Joe Nesbitt as construction superintendent.

The cableway was set up on 100-ft. towers by the steel work subcontractors, Steel Construction Co., Portland. It was planned as a means of working through the winter when the rising river would make use of falsework impossible. The weather men crossed up planners to some extent with an open winter which raised the level of the river a sedate 3 ft. but the sky hook more than earned its keep. It was used to set the steel and to pour the concrete bridge deck.

Vital statistics of the cableway are: length between towers, 650 ft.; main or gut line 2⅝ in.; 105 ft. tower to deadman, Grants Pass end, and 200 ft. to tower on city park end. Deadmen are logs approximately 4 ft. in diameter and 20 ft. long each. Each tower is 100 ft. high put together in three sections on the ground and raised by crane. Main line attached from tower to deadman each end. Four guys on each tower. Winch is 75 ft. right of head tower at the Grants Pass end.

Bridge was designed in 3 spans, end spans of 140 ft. and a center span of 100 ft. Steel girders varied in depth from 9 ft. at the hinge to 5 ft. at mid-span. 90-ft. sections straddling the hinge, weighing 20 tons, were set in place over the 2 main piers and welded to girder sections extending from the abutments. Final sections joining the cantilevered girders in the main span were lowered in place from the cableway and welded.

In the fog and rain, arm signals were useless, and a telephone system was used to transmit signals to the operator.

Perfect welding

The job is noted for the perfect welding of the girders, although it will be several years before any of the construction men involved speak of this phase of the operation in language that won't blister paint.

The welding is done to exacting specifications, in cold wet weather, and every weld is checked by X-ray. Stan Bergman, steel erection superintendent, pre-heated the girders, heated low-hydrogen rod and kept it hot in a stove set up on the job and built solid staging beneath the welds.

No breaks in the beading were permitted and each bead had to be ground and polished before the next one was begun. Any evidence of porosity shown in the X-rays required cutting out and re-welding and some welds were redone as many as 8 times. The contractor determined that the welding rod was burying its own slag and causing porous streaks to show in test film. He switched to an A Smith lime-coated rod and countered little further troubl

Job started August 14 with struction of the 4 supporting p It was essential that these be pleted before onset of winter which can turn the Rogue fro shallow fishing stream to a tor 40 ft. deep. At the bridge site river channel hugs the south b Superintendent Joe Nesbitt a dike out from the opposite about two-thirds of the way a the river, enabling him to buil 2 central piers in the dry.

When footings were poured built 2 complete sets of form the complex web-wall hollow p enabling him to pour the spec shallow lifts alternately. T were completed well ahead of ter.

Bridge deck

After the steel had been se gut was used again to pour con for the bridge deck, with a bucket filled from transit trucks. Nesbitt observed tha bucket could be spotted di over the forms, and was con ably faster and cheaper th truck and buggy setup which wise would have been requir

The bridge is about 500 y stream from an older triple structure known as Cave Bridge. When officially opene new span will carry northb 1-way traffic on US 99, and

SIT-MIX truck fills concrete bucket from Deck was poured in 60-yd. sections.

nd vehicles will move over eman.

onnel

eel was supplied by Gunder- Bros. of Portland. Oregon hway Department personnel : Frank D. Morgan, division neer; L. R. Chandler, assistant ion engineer; Ivan R. Mer- t, bridge engineer; and Roy ton, resident engineer.

litional excavation ed at Rocky Reach

RE THAN a quarter million c yards of additional rock will xcavated adjacent to the rail- tunnel at Orondo "to avoid er to life and property," Che- County PUD commissioners decided. The additional work be a part of the Rocky Reach hway and railroad relocation was recommended by Stone & ster engineers and the Wash- on Department of Highways. onald M. Drake Co., holder of ection II contract, will remove estimated 290,000 cu. yd. of at a cost of $611,900. Drake's nal contract for the 10½ mi. ilway and 9½ mi. of highway ation work was for $3,832,177.

the course of construction, lines in the rock formation e vicinity of the railroad tun- were observed. An investiga- was conducted by W. F. Swi- Stone & Webster geologist, and Howard A. Coombs, consulting gist. They recommended that ock in this area be excavated the natural strata planes to ide a ¾-to-1 slope instead of ¼-to-1 slope specified in the nal plans.

News of DISTRIBUTORS

Cummins of Montana doubles plant facilities

Paul Prestrud, vice president of Cummins Diesel Sales of Montana, Inc., announces start of construction of new addition to its plant in Billings. The present plant will be doubled in size from 80 x 120 ft. to 160 x 120 ft. The new facility will be finished about Oct. 1.

Miller Machinery appoints Burtness

B. M. Burtness has been appointed salesman by Miller Machinery Co. of Missoula, Mont., to cover the Billings territory. He will work out of the branch office at Billings. Burtness was for six years with Seitz Machinery Co., Billings, and prior to that was with Wortham Machinery Co. of Cheyenne, Wyo. for 17 years.

Howard Western joins Holland

Holland Equipment Co. of Salt Lake City, Utah, has added Howard A. Western to its staff. For the past two years Western was sales engineer for Western Fence & Wire Works, Portland, Ore., and prior to this had many years experience in the Salt Lake area with one of the larger construction equipment firms. His territory will cover the northern section of Utah, western Wyoming, and southeastern Idaho.

Western

Hutt

Dale Hutt appointed manager of Western Equipment Co.

Dale O. Hutt has been appointed as general manager of Western Equipment Co., Caterpillar dealer for southern Idaho, eastern Oregon, and western Wyoming. He succeeds G. M. Gehrke who recently resigned. With main office located in Boise, Western has branches in Idaho Falls, Pocatello, Burley, and Twin Falls in Idaho, and at Ontario, Ore. Hutt has been associated with Caterpillar equipment for twenty years, both with the manufacturer, and at the dealer level. He comes to Western Equipment from Foley Tractor Co., Wichita, and will make his home in Boise.

Industrial Engine named by Continental Motors

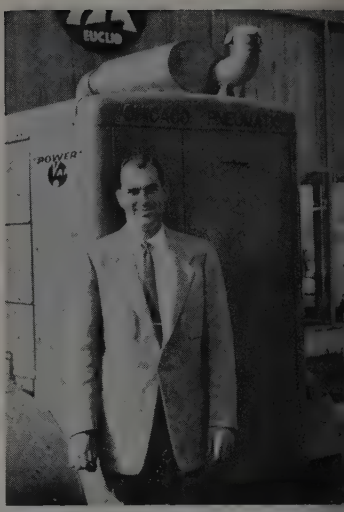
Industrial Engine Service, Los Angeles, has been appointed an authorized distributor of Continental diesel and gasoline engines, serving the Southern California counties of Los Angeles, San Bernardino and Riverside.

Changes at Sanford Tractor & Equipment Co. announced

R. V. Robertshaw, general manager for Sanford Tractor & Equipment Co., Reno, Nev., announces the promotion of Edward W. Temp to industrial sales manager. Temp has been selling in the Northern California and Nevada area for many years, and has been a resident of Reno for the past twelve years. Sanford recently established an advertising and sales promotion department headed by Stanley F. Pomin, Jr. A new account also was recently taken on by this distributorship: Homelite pumps and generators.

Sales appointment by FWD Pacific

Frank Hoover of South Daniel Way, San Jose, Calif., has recently been added to the sales staff of FWD Pacific Co., San Francisco. He will cover the following territory for all lines handled by the company: San Mateo, Santa Cruz, Monterey, Santa Clara, San Benito, Stanislaus, Merced, Mariposa, Madera, Fresno, Kings, and Tulare counties.



JAMES B. McGOVERN heads the new formed air equipment department Evans Engine & Equipment Co., Seat This Washington company recently ceived appointment as exclusive distr utor for Chicago Pneumatic air compr ors and air tools in western Washing and Alaska.

Trojan appointments in West

The Yale & Towne Manufact ing Co. has appointed five new tributors for its Trojan tractor s vel line in the West. Road Mach ery Co., Phoenix, is the Trojan tributor for the entire state of A zona; Connell Motor Truck Inc., Stockton, for Madera, Fres Kings, Tulare and Kern counties California; Macdonald Equipm Co., Denver, for the entire state Colorado. Also Manitou Eq ment Co., Portland, Ore. for all Oregon, and five counties in W ington; Century White Truck Inc., Casper, for the entire state Wyoming, except Teton, Linc Sublette, Sweetwater and U counties.

Gunderson takes on salesman, line, and new dealer

Joining the sales staff of Gun son Bros. Engineering Co., P land, Ore. is Kirk Lowe, form with Isaacson Iron Works, and ternational Harvester. He wil responsible for sale of General tors diesel engines, Allison to convertors and torqmatic trans sions in northwestern Oregon southwestern Washington. Re ly added to its accounts is the Rotopamic air cleaners, a dry filter said to virtually elimi maintenance on air cleaners.

Gunderson Bros. also anno the addition of Haupert Tra

Co., Medford, Ore., as a Detroit Diesel dealer to serve GM diesel owners in Lake, Klamath, Jackson and Josephine counties in Oregon, and Siskiyou and Modoc counties in California. G. T. "Bud" Haupert heads the Medford organization.

Smith Booth Usher acquires Michigan line in Southern Calif.

Smith Booth Usher Co., Los Angeles, has been appointed to sell and service the Michigan line of construction machinery, according to A. E. York, sales manager, Construction Machinery Division, Clark Equipment Co. Territory covered by the new distributorship comprises the following California counties: San Diego, Imperial, Orange, Riverside, Santa Barbara, Ventura, Los Angeles, San Luis Obispo, and part of San Bernardino.

Promotion at Peterson Tractor

Appointment of T. V. Barton as industrial sales manager at Peterson Tractor Co., San Francisco Bay area Caterpillar dealer, is announced by Howard Peterson, president of the firm. Barton was formerly with the Columbia-Geneva Steel Division, U. S. Steel Corp., and in the sales department of Dorr-Oliver, Inc. before joining Peterson three years ago. He will direct industrial sales operations of Caterpillar Tractor Co. equipment and allied products in this area.

Worthington names Washington outlet

Worthington Corporation announces appointment of Mid-Mountain Machinery Co., Spokane, Wash., to handle distribution of construction equipment in the state of Washington. Counties to be covered are Franklin, Walla Walla, Columbia, Garfield, Asotin, Adams, Whitman, Lincoln, Spokane, Ferry, Stevens and Pend Oreille.

New Hi-Way distributor

Lowry Equipment Co., Redding, Calif., is a new distributor for Highway Equipment Co., Cedar Rapids, Iowa. Serving the upper northeastern section of California, Lowry will handle the Hi-Way line of ice control spreaders and bituminous paving equipment.

Rasmussen Equipment adds to personnel and accounts

Rasmussen Equipment Co., Sal Lake City, has added two to its per sonnel and taken on a new account Pat Preston, 525 28th St., Ogden Utah, has been named sales repre sentative, while Mike Brown ha been appointed to sales and parts New account is the Hy-Hoe all hy draulic back hoe manufactured b Hydraulic Machinery Co.

Washington Machinery adds Scoopmobile

Washington Machinery Co., Se attle, headed by Hil. Berglund president, announces that th Scoopmobile manufactured by Mix ermobile Manufacturing, Inc., ha been added to its many accounts.

New man, new line for Bros

Darrell J. Keaton has joined th Bros Company, Oakland, Calif. A specialist in steam boiler controls Keaton spent a number of year with Minneapolis-Honeywell Reg ulator Co. The Clayton steam gen erator, applicable to many con struction needs, was recently adde to Bros contractor equipment lines

Roeder Equipment Co. moves

Roeder Equipment Co. ha moved to a new location at 28 Gould St., Reno, after thirty year at its old location. Three new ac counts recently taken on by Roede are Insley Manufacturing Corp Seaman-Andwall Co. and Kolma conveyors. Fred P. Meagher is ge eral manager.

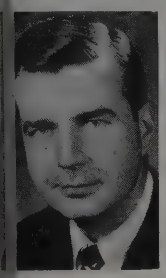
Partnership formed; name change

Industrial Service Co. (formerl Knapp Industrial Service Co.), is recently formed partnership Gene Knapp and L. G. "Len" Hil bard with headquarters at 51 Twelfth St., Sacramento, Cali Knapp was for twelve years owne of Knapp Industrial Service at th above address, and Hibbard was long-time industrial sales manage in Sacramento and the surroun ing valley area. The varied exper ence of both partners and add tional lines combine to give th firm a wider range of supplies an services. Some of the more recentl acquired accounts are Velvetouc brake blocks, Gill spark arrestor Baldwin oil filter elements, piston

ANUFACTURERS

cyrus-Erie promotes Shew

Frederick B. Shew has been appointed manager of sales, cranes d excavators, by Bucyrus-Erie ., South Milwaukee, Wis. cyrus-Erie's commercial line in-



Frederick B. Shew

des ⅜ to 4-cu. yd. excavators d cranes; 10 through 45-ton tran- cranes, and ⅜ and ½-yd. Hydro- nes. Shew joined the company 1956 following a 6-year associa- n with Wellman Engineering

rn opens Denver branch

A. C. Horn Companies announc the opening of new sales offices a d warehouse facilities in Denver, Colo., as another step in keeping pace with the rapid growth in the Rocky Mountain area. Clyde Pooser, formerly from the Los Angeles office, will head the Denver operations as branch manager. The new factory branch location is at 2050 West 7th Ave. The Horn company, for sixty years a manufacturer of quality construction materials, technical coatings, and maintenance products, maintains a staff of ten sales engineers throughout the Intermountain states.

Loeffler heads Kaiser Aluminum dome sales

R. D. Loeffler has been appointed manager of dome sales for Kaiser Aluminum & Chemical Sales, Inc. Since joining the company in 1955, he has served on the sales staff in the Los Angeles District, and more recently as branch manager in Phoenix, Ariz. In his new position, he will have responsibility for the sale of stressed-skin aluminum domes, the versatile structures designed and developed by Kaiser Aluminum.

Wire Rope Corp. opens warehouse

Wire Rope Corporation of America announces the opening of

a new warehouse in the Los Angeles area. Located at 1018 S. Santa Fe Ave., the new facility will service distributors with WIRECO Brown Strand wire rope and slings throughout Southern California; Las Vegas, Nev.; and Prescott, Phoenix and Tucson, Ariz. District sales manager is Harry Springmeyer.

Stanley Soule' appointed vice president-marketing

Stanley E. Soule' has been appointed vice president-marketing of Soule' Steel Co., San Francisco. Formerly assistant general sales manager of the company, in his newly-created post Soule' will direct the marketing activities of the firm, a major manufacturer and distributor of steel and aluminum building products.

Le Roi names Koehler sales manager

Le Roi Division of Westinghouse Air Brake Co., Milwaukee, Wis. announces the appointment of Richard H. Koehler as general sales manager. Koehler succeeds Jack E. Heuser who resigned to join a management consulting firm. Le Roi manufactures an extensive line of portable and stationary air compressors and pneumatic air tools for the construction industry and other markets.

OFFICIALS from Cummins Engine Co. and Clark Equipment Co. were present [illegible] **Tucson, Ariz., as the one millionth Cummins "V" horsepower went into service in** [illegible] **Michigan 480 tractor-dozer delivered to M. M. Sundt Construction Co. From left, *Pa*** [illegible] ***O. Miller*, president of Cummins Arizona Diesel; *R. B. George*, manager of Weste** [illegible] **Machinery Co., Phoenix; *John S. Sundt*, president of Sundt Construction Co.; *C.*** [illegible] ***Wilhite*, manager of construction sales for Cummins Engine Co., Columbus, Ind., an** [illegible] ***Leigh M. Jones*, general manager of Western Machinery Co.**

C.I.T. names Koenig in Oregon

Herbert Koenig has been named by C.I.T. Corporation as its field representative in eastern Orego and east Portland, Randolph J. M Master, assistant vice president an head of the Portland division, a nounces. Headquartering in Por land, Koenig will work directl with the contracting industry an other businesses in the area to a range installment financing machinery and equipment.

UNIT PRICES

Selected abstracts for Western projects

DAM—Wanapum Dam on Columbia River

Washington—**Grant County Public Utility District.** A low bid of $88,879,410 for the construction of Wanapum Dam on the Columbia River near Ephrata, Wash., was submitted by Grant County Constructors, a joint venture consisting of Morrison-Knudsen, Kaiser, Macco, Raymond and F & S. The engineers' estimate was $137,625,000.

(1) Grant County Constructors ..... $ 88,879,410
(2) Northwest Dam Constructors 96,055,425
Merritt-Chapman & Scott 97,073,300
Perini-Jones-Walsh 99,315,298
Dixon-Arundel-Am. Pipe-H&C-Atkinson 107,937,222

		(1)	(2)
Lump sum	Move in	$2,750,000.00	$2,750,000.00
Lump sum	Lab. & field inspec. office facilities & utilities	67,500.00	50,000.00
191,000 sq. ft.	Cutoff wall excavation at depths of 50 ft. or less	2.60	4.50
109,000 sq. ft.	Cutoff wall excavation at depths greater than 50 ft.	2.85	6.00
284,000 sq. ft.	Cutoff wall backfill	1.10	.40
5,850 cu. yd.	Conc. surf. pl. underwater for cutoff wall	36.00	18.00
320 ea.	Setting up over grout & check holes to be drilled for seepage cutoff	51.00	110.00
39,000 lin. ft.	Drilling grout holes & Check holes through soil	11.50	8.50
12,800 ea.	Conn. to drilled grout & Check holes for seepage cutoff	11.00	6.00
51,000 cement	Processing, mixing and placing grout in grouted cutoff	3.75	1.15
1,650 cu. yd.	Silt in grout	41.20	20.00
150 cu. yd.	Clay in grout	41.20	60.00
12,800 lin. ft.	Sleeve pipe	2.60	3.50
Lump sum	Div. & care of water	3,175,000.00	5,062,080.00
500,000 cu. yd.	Embankment excav.	.70	.30
915,000 cu. yd.	Spillway excavation	.30	1.50
1,400,000 cu. yd.	Powerhouse excav.	.80	2.00
2,915,000 cu. yd.	Tailrace excavation	.30	.45
1,900,000 cu. yd.	Approach channel excav.	.35	.45
38,300 sq. ft.	Line drilling & broaching	2.30	2.00
60,800 sq. yd.	Rock foundation prep.	4.50	5.50
1,000 ea.	Setting up over grout, check, drain or explor. holes to be drilled	21.20	8.00
24,000 lin. ft.	Drilling AX holes	3.80	2.50
7,100 lin. ft.	Drilling BX holes	5.10	3.50
16,000 lin. ft.	Drilling MX holes	7.25	4.00
4,000 lin. ft.	Core recovery	1.05	1.50
200 ea.	Core bores	8.50	6.00
800 ea.	Connections to drilled grout holes	15.60	10.00
19,000 lin. ft.	Drilling anchor bar holes	1.90	1.00
17,000 cement	Processing, mixing, and placing found. grout	2.35	2.60
150 cu. yd.	Sand in grout	81.50	10.00
120 ea.	Setting up over anchorage holes to be drilled	115.00	100.00
5,760 lin. ft.	Drilling anchorage holes	43.40	50.00
712,300 lb.	Anch. cables & fittings	.59	.48
8,000 cement	Processing, mixing, and placing grout for cable anchorages	2.25	6.25
170 lin. ft.	Rem. of anchorage cables	162.00	75.00
590,000 cu. yd.	Impervious fill	1.10	.50
1,600,000 cu. yd.	Pervious fill	.25	.20
355,000 cu. yd.	Transition fill	.92	.75
108,000 cu. yd.	Filter material	.88	1.50
220,000 cu. yd.	Pervious fill placed underwater	2.90	2.50
459,000 cu. yd.	Rockfill	.90	1.00
300 cu. yd.	Slush grout	33.00	15.00
7,000 cu. yd.	Derrick stone	3.95	7.00
108,000 cu. yd.	Rockfill other than in embankments	2.00	.70
122,000 cu. yd.	Riprap	2.50	1.70
6,700 cu. yd.	Base course	3.40	2.80
2,600 cu. yd.	Surface course	6.50	2.50
230 ton	Bituminous cement	95.00	30.00
185,000 cu. yd.	Spillway concrete, mass	9.50	8.50
635 cu. yd.	Spillway, concrete, deck and parapets	34.00	26.00
578,500 cu. yd.	Powerhouse concrete	11.00	10.00
201,200 cu. yd.	Concrete in gravity dam, left abut. retaining wall and similar walls	8.50	8.00
123,800 cu. yd.	Fish passing facilities concrete	10.00	10.00
100 cu. yd.	Misc. concrete	62.00	25.00
2,000 cu. ft.	Insulating concrete	3.00	2.50
1,005,200 bbl.	Portland cement	4.69	5.00
45,500 ton	Pozzolan	16.62	13.00
1,702,500 sq. ft.	Forms, straight	1.80	2.00
489,000 sq. ft.	Forms, curved	2.60	2.75
1,500,000 lb.	Steel reinforcement and anchor bars	.12	.13

HIGHWAY—8.738 mi. of asphalt road

Utah—Garfield County—State. Whiting & Haymond Construction Co. of Springville, Utah, submitted a low bid of $332,607 for 8.738 mi. of 2½-in. road-mixed bituminous surfaced road with one concrete and steel structure. Project is on highway 54 near Henrieville.

(1) Whiting & Haymond $332,607
(2) L. A. Young Sons 336,282
D. W. Brimhall, Maurice Rasmussen, Johnson 338,054
W. W. Clyde 350,242
General Contracting Corp. 359,245

		(1)	(2)
969 ton	Bituminous material, Type MC-3.	$ 40.60	$ 40.00
171 ton	Bit. mat., Type MC-1 or MC-2...	40.60	40.00
111 ton	Bituminous material, Type RC-4.	43.70	43.00
257 gal.	Bit. additive (com. grade).....	2.50	2.25
8,711 mi.	Scarifying and mixing	700.00	1,000.00
1,300 ton	Cover material, Type "A".....	3.50	3.00
1,300 ton	Cov. mat., Type "A" (in stockpile)	2.50	2.00
43,100 ton	Gravel surface, Type "B".....	.70	.70
57,000 ton	Gravel base course	.67	.70
153,000 cu. yd.	Unclass. roadway excavation	.24	.30
231,000 sta. yd.	Class "A" overhaul	.01	.015
4,600 yd. mi.	Class "B" overhaul	.15	.20
5,100-1000 gals.	Watering	1.00	.75
1,200 hour	Rolling, tamping roller	4.00	6.00
180 hour	Rolling, pneu. tire or power roller	8.00	10.00
120 hour	Self propelled pneu. tired roller...	8.00	12.00
730 lin. ft.	8" perforated C. M. pipe	1.90	2.00
198 lin. ft.	15" C. M. pipe	3.30	3.50
258 lin. ft.	18" C. M. pipe	4.00	4.00
2,664 lin. ft.	24" C. M. pipe	6.50	6.00
468 lin. ft.	30" C. M. pipe	8.00	8.00
298 lin. ft.	36" C. M. pipe	12.50	12.00
448 lin. ft.	48" C. M. pipe	18.00	16.00
98 lin. ft.	48" C. M. pipe (10-gage).....	23.00	20.00
72 lin. ft.	60" C. M. pipe	30.00	26.00
94 lin. ft.	60" C. M. pipe (8-gage).....	35.00	30.00
204 lin. ft.	72" C. M. pipe	37.00	33.00
70 lin. ft.	C. M. pipe-arches, 22" x 13".....	4.25	4.50
110 lin. ft.	C. M. pipe-arches, 29" x 18".....	6.75	7.00
137 cu. yd.	Concrete, class "A"	90.00	80.00
2 cu. yd.	Concrete, class "AA"	100.00	85.00
16,800 lb.	Reinforcing steel	.14	.18
280 hour	Mechanical tamping	6.50	6.00
1,600 cu. yd.	Excavation for structures, unclass.	2.00	1.00
1,000 cu. yd.	Small ditch excavation	.75	1.00
3,000 lin. ft.	Surface ditches	.10	.20
2,200 cu. yd.	Loose riprap	3.50	3.00
314 each	Guide posts	7.00	10.00
668 lin. ft.	Deep beam highway guard rail (concrete posts)	4.00	4.00
9,000 lin. ft.	Right of way fence, Type "B"...	.33	.38
6 each	14' gates	35.00	50.00
6 each	16' gates	45.00	50.00

110 each	Right of way markers	7.00	10.00
2 each	F.A.P. markers	35.00	50.00
Lump	Furnishing water equipment	5,800.00	2,000.00
160 cu. yd.	Granular backfill	7.00	7.00
Lump	Furnishing construction signs	1,500.00	1,000.00
	(1) Concrete and Steel Bridge		
390 cu. yd.	Exc. for structures, unclassified	3.00	2.00
206 cu. yd.	Concrete, class "A"	79.00	78.00
3,850 lb.	Reinforcing steel	.14	.15
0,025 lb.	New structural steel	.27	.25
Lump	Fabr. and erect. of structural steel furnished by the state	9,000.00	8,300.00
302 lin. ft.	Steel hand rail	12.50	12.00
364 lin. ft.	Piles (other than timber)	15.50	13.00
Lump	Furnishing pile driving equip.	4,000.00	3,500.00
Lump	Removal of existing structure	800.00	2,000.00

)AM—Cougar Dam in Oregon

Oregon—South Fork McKenzie—Corps of Engineers. Merritt-Chapman Scott Corp. submitted the low bid of $23,985,564 for construction of m and outlet works, power intake works and roads at Cougar Reservoir South Fork McKenzie River. There were 14 bidders.

) Merritt-Chapman & Scott $23,985,564
) Utah-Manhattan 25,841,219
Montag-Halvorson-McLaughlin 26,166,810
Kaiser-Raymond-Macco 26,994,044

		(1)	(2)
1 job	Div. and care of water	$200,000.00	$300,000.00
1 job	Trash removal & disposal	15,000.00	8,000.00
1 job	Div. tunnel upstream portal structure	65,000.00	118,000.00
1 job	Div. tunnel stoplogs, in place	30,000.00	27,000.00
1 job	By-pass bulkhead, in place	6,000.00	5,000.00
1 job	Concrete tunnel plug	50,000.00	32,000.00
	Deleted		
	Deleted		
	Deleted		
1,850 lin. ft.	Permanent trash boom	14.00	5.40
	Excav. roadway U/S of Sta. 128+00, unclassified		
255,000 cu. yd.	a.	1.35	1.50
75,000 cu. yd.	b.	1.35	1.45
79,000 cu. yd.	Excav. tailrace D/S of Sta. TR33+00 & RO24+00.5, unclassified	.90	1.35
286,000 cu. yd.	Excav. right abutment	1.41	1.40
	Excavation quarry		
227,000 cu. yd.	a.	1.41	1.24
580,000 cu. yd.	b.	1.40	1.15
273,500 cu. yd.	Excavation, common	.55	.64
560,000 cu. yd.	Excav. common imp. borrow Area D	.80	1.46
	Excav. common Annie Creek imp. borrow area		
100,000 cu. yd.	a.	.85	1.60
60,000 cu. yd.	b.	.60	1.00
960,000 cu. yd.	Excav. unclassified gravel transition borrow area	.70	1.11
150,000 cu. yd.	Excav. common stockpiled imp. material	2.00	1.10
	Excav. common, rockfill dam Area		
1,000,000 cu. yd.	a.	.40	1.08
520,000 cu. yd.	b.	.35	1.02
22,500 cu. yd.	Excavation, common, intake structure	.90	2.00
559,000 cu. yd.	Excav. common, regulating outlet channel	.55	.90
25,500 cu. yd.	Excav., rock, left abutment	2.30	4.50
341,000 cu. yd.	Excav., rock, structural, right abutment	1.40	1.60
	Excav., rock, rockfill dam foundation		
45,000 cu. yd.	a.	5.00	4.80
20,000 cu. yd.	b.	3.50	3.40
134,000 cu. yd.	Excav., rock, intake struct.	3.00	2.85
20,000 cu. yd.	Excavation, tunnels	18.00	40.00
	Preliminary found. cleanup		
15,000 sq. yd.	a.	4.50	2.65
10,000 sq. yd.	b.	4.50	1.85
30,100 sq. yd.	Final foundation cleanup	5.00	3.50
	Berm barrier		
2,000 lin. ft.	a.	17.50	9.00
1,000 lin. ft.	b.	17.50	9.00
	Chain link wire mesh, in place		
360,000 sq. ft.	a.	.40	.45
300,000 sq. ft.	b.	.18	.29
	Chain link wire mesh, removal		
10,000 sq. ft.	a.	.26	1.00
70,000 sq. ft.	b.	.10	.35
	Rock bolts, in place		
2,800 lin. ft.	a.	2.85	7.40
7,300 lin. ft.	b.	1.65	3.60
7,672,000 cu. yd.	Class I rockfill, 3-ft. layers	.10	.10
1,810,000 cu. yd.	Class I rockfill, 18-in. layers	.13	.10
156,000 cu. yd.	Class I rockfill, spalls	.50	.20
1,377,000 cu. yd.	Class II rockfill	.13	.10
820,000 cu. yd.	Impervious core	.20	.40
9,900 cu. yd.	Revetment, Class A	4.75	9.00
8,100 cu. yd.	Revetment, Class B	4.75	5.50
680,000 cu. yd.	Gravel transition	.20	.18
	Additional rolling for compac.		
100 roll hr.	a.	25.00	25.60
1,000 roll hr.	b.	20.00	24.00
27,000 lin. ft.	Drilling EX curtain grout hole	2.30	2.70
11,450 cu. yd.	Concrete, spillway	25.00	28.00

CLASSIFIED

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

FOR SALE

Rates are $15.50 a column inch. Copy should be sent in by the 15th of month preceding publication date.

Yuba makes top level appointments

Several management changes have taken place at Yuba Consolidated Industries, Inc., San Francisco. J. Philip Murphy, formerly vice president and general manager of Judson Pacific-Murphy Division of Yuba, has been appointed vice president of operations for the structural and reinforcing bar divisions. He will be responsible for coordinating all manufacturing activities related to fabricated structural and reinforcing steel. His previous post will be filled by Richard A. Murphy, plant manager at Judson Pacific.

Kenneth Dewing has been named chief engineer of Yuba's manufacturing division in Benicia, Calif. Dewing was formerly chief engineer for all crane and related equipment manufacturing operations at Judson Pacific-Murphy, Emeryville. In making the announcement, John L. McGara, Yuba president, added that all crane and allied equipment manufacturing has been moved to the Benicia plant. Named district sales manager of the newly established Seattle office of Yuba Consolidated Industries is Jack P. Tepley. Prior to joining Yuba, Tepley was general sales manager for Pacific Coast Engineering Co., Alameda, Calif.

Southern Pipe builds in Hawaii

Construction of a steel pipe fabricating and processing plant in the Hawaiian Islands is under way by the Southern Pipe Division of U. S. Industries, Inc., Azusa, Calif. Southern Pipe is reported to be the first mainland firm to undertak construction of a major manufac turing facility in the Islands sinc Hawaii statehood. Located on a 4 ac. plot on the south coast of Oahu the new plant is expected to mak its first delivery in August to th City of Honolulu.

Managerial promotions

C. M. Basile, N. V. Chehak, an M. P. Luber have been elected t new positions in Link-Belt Speed er's management group. Basil following many years of manageria experience with Link-Belt Co joined the Cedar Rapids organiza tion in 1950, and since 1955 ha served as vice president of manu facturing and sales until this mos recent election to executive vic president. Newly elected to the po sition of vice president and sale manager, N. V. Chehak had bee sales manager since 1958. Befor coming to Link-Belt Speeder i 1948, he had been associated wit three different construction firms M. P. Luber was elected vice pres dent of manufacturing. He starte with the company in 1946 an served in various important capa cities until his promotion in 195 to general plant superintendent.

Michael Davidson replaces Bosle

Michael Davidson has joined th San Leandro, Calif., office as fiel engineer for the Nelson Stud Welc ing Division of Gregory Industrie Inc., Lorain, Ohio. Formerly in th Los Angeles office, Davidson re places A. E. Bosley, who has bee transferred to Los Angeles as di trict manager. Verne Bender con tinues as Western regional mana ger.

Ronald Harrer joins AMF DeWal

Ronald L. Harrer has been ap pointed as a district sales manage for AMF DeWalt, with respons bility for sales coordination withi the area covering the state of Ar zona, southern Nevada, and soutl ern California. In his new capacit Harrer will represent the complet tool line of AMF DeWalt.

Edgar Percy made sales manager

Edgar W. Percy has been ap pointed sales manager of Willian Bucket Division, The McDowel Wellman Companies, Clevelan He has been with Williams sinc 1936 and served as assistant sal manager since 1957.

ADVERTISERS in this issue

BACKFILL, uncompacted

Specifications revisited

For the past several weeks agents from this magazine have been in bars all over the West buying drinks for contractors in order to find out what they think is wrong with specifications. As a result of this massive research program we were able to develop a set of standard specifications embodying the many ideas and suggestions given to us by active contractors. Samples of these specifications are printed here. Their adoption by contracting agencies would go a long way toward eliminating job delays and complaints from contractors, with resulting economies to the Owner.

If the agent we sent to Laramie, Wyo., on April 13 reads this, will he please report to the nearest check point?

START OF WORK – Contractor shall commence work at such time as his other projects are sufficiently complete so that new men and equipment need not be obtained. If four (4) months should elapse from date of contract award without Contractor moving into site, Contractor must send to Engineer's field office a notarized statement estimating when and if work will start.

UNIT BIDS—If during the prosecution of the work the Contractor should find that costs are running above the estimate, adjustments in original unit bids may be made accordingly. Contractor hereby agrees to exercise restraint and good judgement in this regard, in order that this privilege will not be abused.

CHANGES – The Engineer shall not cause, nor seek to cause, anything joined together by the Contractor to be ripped asunder, except at rates determined by the Contractor. Anything bound or loosed by the Contractor will remain bound and loosed by the Engineer.

INSPECTORS—Realizing that inspectors are often inexperienced and in need of guidance, the Contractor reserves the right to send any or all inspectors to boarding school for the duration of the project.

PLANS AND SPECIFICATIONS —Both the spirit and the letter of the plans and Specifications shall be observed carefully by the Contractor, except in those cases where to do so would slow the work down, make it more costly, or both.

DISPUTES – If a dispute should arise between the Contractor and the Engineer regarding the intent of the plans and specifications, the Engineer and his staff and Owner and his staff are free to argue about it among themselves as long as th like, while the Contractor g ahead and builds the project he sees fit.

PUBLIC RELATIONS – Shou property owners adjacent to t project, or tourists, or visitors, the general public, complain to irritate the Contractor, or interfe with his operations in any way, is empowered to capture all su persons and confine them, for the safety, for the duration of the co tract, in dry, sanitary quarters, wi adequate heat and light, witho imposing cruel or unusual punis ments.

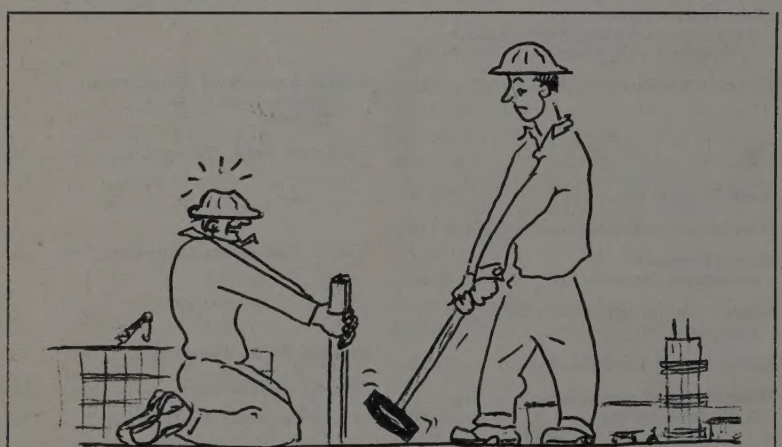
DELAYS – Should the project delayed due to acts of God or the public enemy, or of the Go ernment, in either its sovereign contractural capacity, epidemic quarantines, embargoes, fallou hangovers, or cirrhosis of the liv the Engineer and Owner will ta whatever action necessary to enab the Contractor to recover lost tir and realize a profit, such action consist of doing manual labor enlisting the aid of the militia. order that the project may fini on time without unusual effort the part of Contractor, the En neer will eliminate part of t project for each day lost.

BRIBES AND KICKBACKS—T Engineer or inspectors may not turn damaged merchandise to t Contractor, nor merchandise n accompanied by a sales slip. T Engineer, before start of work, sh submit in writing to the Contract his desired percentage of profits sulting from use of substanda materials. In no case and at time shall the Engineer or insp tors ask goods or services of t Contractor not available in t local area.

FAILURES—If, when work is co pleted, and the Contractor h moved to another project, t embankment, pavement, impro ment, structure, or facility shou fail or collapse, the Engineer w not remember ever seeing the Co tractor on the project. Should t project fail or collapse while t Contractor is still on the site, will be the fault of the design.

COMPLETION—Should the Co tractor desire to abandon the pr ect before completion, he shall permitted to do so provided t site is left free of paper bags a orange peels.

Down-time . . . . . By Domagalski



"Good cut, Kid. Now just a little to you on the next one."

Western Construction