WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED
WESTERN HIGHWAYS BUILDER

PUBLISHED MONTHLY
VOLUME XXV, No. 4

APRIL 15 • 1950

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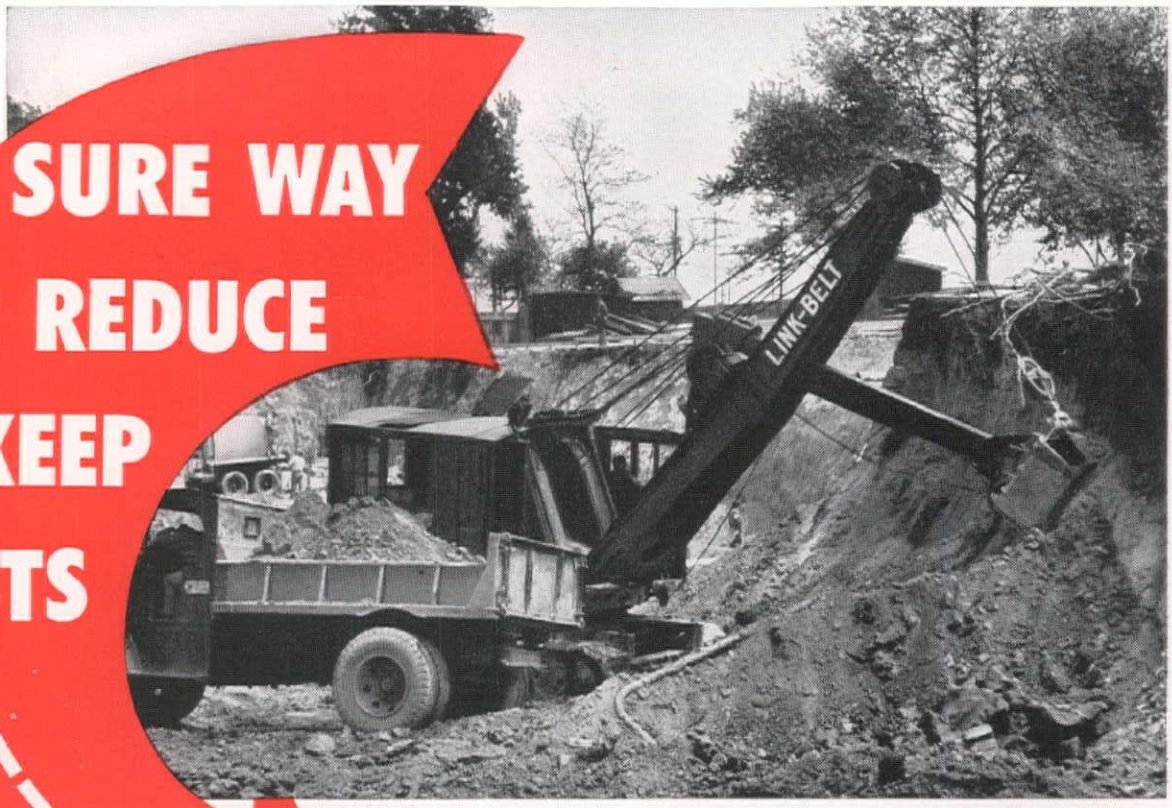
War-Surplus Steel Builds A County Bridge ... Page 92

SURE WAY TO REDUCE UPKEEP COSTS



Use TEXACO MARFAK

it prolongs the life of all chassis parts

Even the roughest service won't pound or squeeze *Texaco Marfak* out of chassis bearings. This famous lubricant assures protection against wear and rust for extra hundreds of miles. *Texaco Marfak* saves parts replacements, keeps equipment on the job and out of the repair shop. And because *Texaco Marfak* is so long lasting, fewer applications are needed—another saving.

In wheel bearings, use *Texaco Marfak Heavy Duty*. It seals out dirt and moisture, seals itself in—assuring safer braking. Bearings last far longer because they get full protection. *Texaco Marfak Heavy Duty* requires no seasonal change.

Two more ways to reduce upkeep costs: (1) Lubricate heavy-duty gasoline and Diesel engines with *Texaco Ursa Oil X★★*—it keeps fuel consumption and maintenance costs low because it cleans as it lubricates. (2) Seal dirt and moisture out of crawler track mechanisms by lubricating with *Texaco Track Roll Lubricant*. It assures longer life parts.

A Texaco Lubrication Engineer will gladly help you simplify your lubrication setup and reduce your maintenance costs. Just call the nearest of the more than 2,000 Texaco Wholesale Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

More than 350 million pounds of Marfak have been sold! ☆ ☆ ☆ ☆

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN . . . TEXACO STAR THEATER starring MILTON BERLE on television every Tuesday night. See newspaper for time and station.

these 12 square inches can mean a vital difference of 20 cubic feet

Every architect, engineer and contractor knows that a concrete mixer drum must provide elbow room for the materials to mix properly.

Concrete authorities have accurately determined the proportions of such *free mixing space* needed in truck mixers and agitators to insure high strength, quality concrete.

Your eye cannot detect that a machine which claims 3 cubic yards capacity as a truck mixer actually has 20 cubic feet less than the minimum requirement for good mixing—***but it can always see that such a non-standard truck mixer never bears this rating plate.***

Look for this rating plate on the truck mixers that supply your jobs. It guarantees that the supplier is maintaining these quality standards on which the $250,000,000 ready-mixed concrete industry has been built.

The Bureau rating plate is available to any manufacturer who meets its quality standards and requirements

Affiliated with The National Ready Mixed Concrete Association

BLAW-KNOX DIVISION
Pittsburgh, Pa.
CHAIN BELT COMPANY
Milwaukee, Wis.
CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.
THE JAEGER MACHINE COMPANY
Columbus, Ohio
WORTHINGTON PUMP & MACHINERY CORP.
Dunellen, N. J.
THE T. L. SMITH COMPANY
Milwaukee, Wis.

Truck Mixer Manufacturers Bureau

WESTERN CONSTRUCTION NEWS

WITH WHICH IS CONSOLIDATED WESTERN HIGHWAYS BUILDER

Volume 25 **APRIL 15 • 1950** Number 4

TABLE OF CONTENTS

Covering Construction in the Western Half of the United States

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B.F.Goodrich

BFG users report: Continued savings —thanks to double bruise protection

B. F. GOODRICH *Universals* were reported by one operator to be in good condition after daily quarry service for over 21 months. Another operator reports over 4500 service hours from Universals against only 1600 hours from another make in identical service. Still another report told of tires that were still "young" at 3200 hours and probably good for thousands more. These actual user reports spotlight the great difference between various makes of off-the-road tires.

When *results* are measured, BFG tires always stand high. There are many reasons for the continuing top performance of B. F. Goodrich tires. For example, notice the tread on the Universals in the picture above. It's designed to give traction both ways. More than that, it is made of specially compounded rubber . . . armor against sharp rocks and other tire killers.

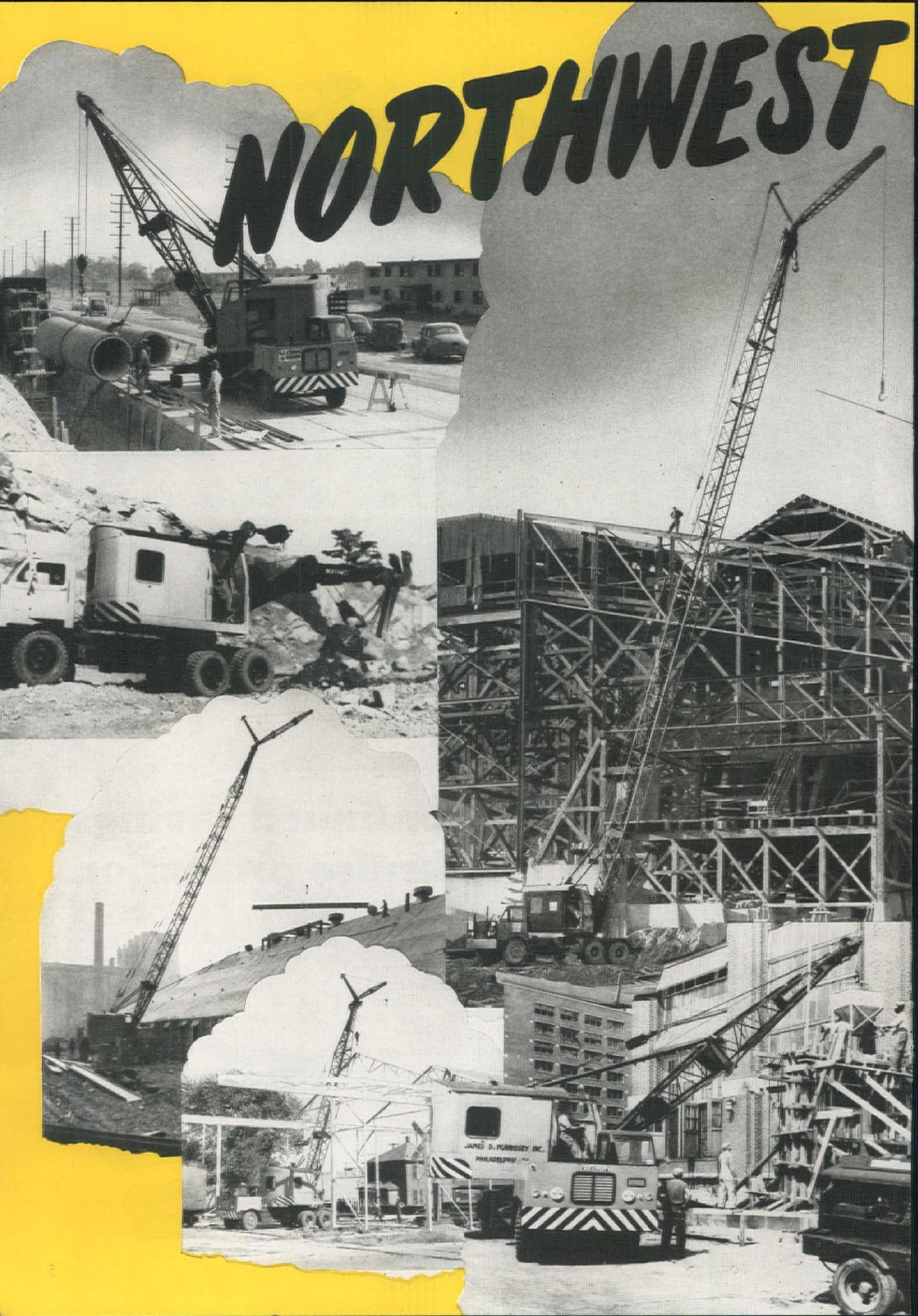
Also, BFG tires have double bruise protection in the form of a *double nylon shock shield* . . . layers of nylon cord built between the tread and the body plies. Under impact, the strong, elastic nylon shields the cord body. And there are two shields for double protection!

Only B. F. Goodrich gives you the added protection of the nylon shock shield; the added savings from (1) longer tire life (2) increased bruise resistance (3) less danger of tread separation (4) more recappable tires. Nylon shock shield costs no extra—you pay no premium.

There's a specially designed *BFG off-the-road tire for every need. See your B. F. Goodrich dealer or call *The B. F. Goodrich Company, Akron, Ohio.*

**Typical example: New ALL-NYLON tire for tough construction projects, quarry work, strip mining, etc. In all tests not a single tire blew out, not one flex break occurred!*

NORTHWEST



TRUCK CRANES.

NO OTHER COMBINATION LIKE IT!

Here are Northwest Truck Cranes on all classes of work from Coast to Coast. They have been proved in every class of operation.

If you are considering rubber mounted equipment you owe it to yourself to find out what the Northwest Truck Crane has for you. There is a Northwest Truck Crane operating near you. Let us tell you where it is and send you complete details. Check Northwest before you buy.

NORTHWEST ENGINEERING CO.
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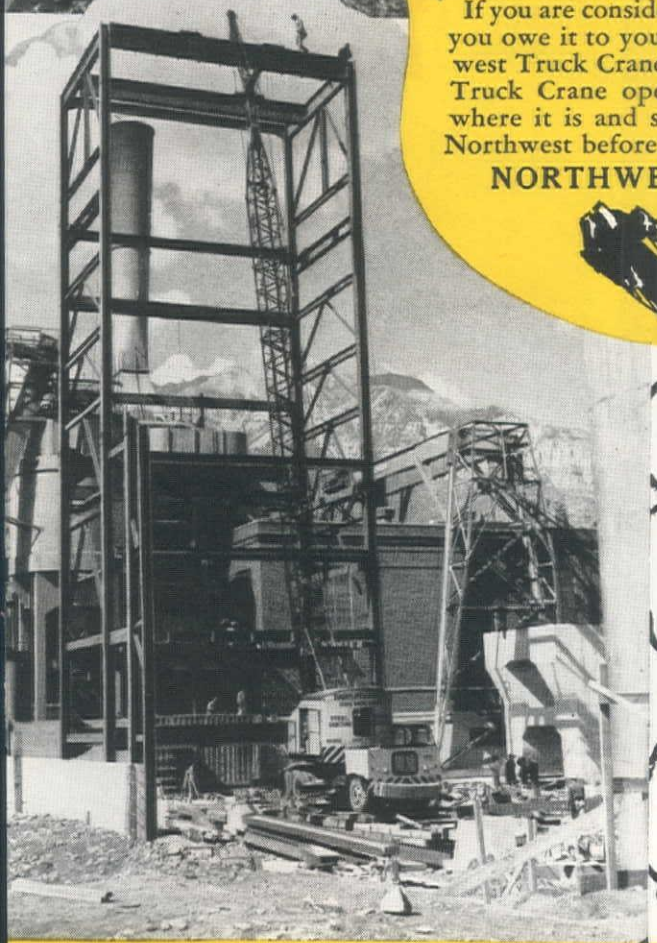
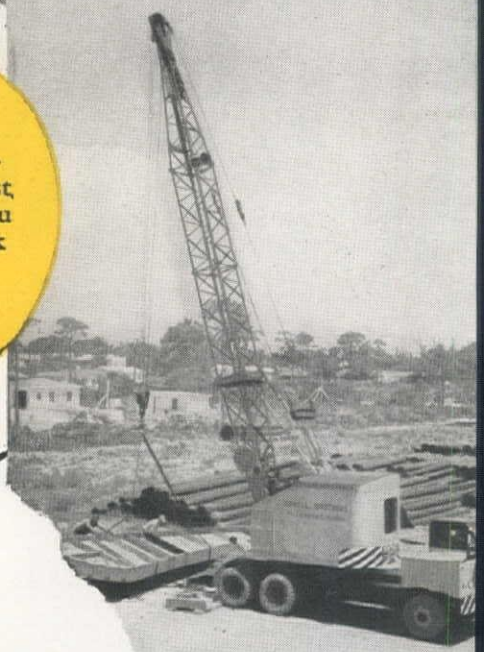
135 South LaSalle St.
Chicago 3, Illinois





NORTHWEST

CHAMPION

WORKIN'EST

Here are some of the exclusive features that give the TD-24 its matchless work capacity:

1. 180-h.p. International diesel engine with gasoline-conversion starting and unmatched "lugability".

2. Synchromesh transmission for easy shift-on-the-go operation; plus eight speeds forward and eight reverse.

3. Planet Power drive, smooth and rugged, for instant speed change up or down one gear without declutching.

4. Planet Power steering to provide power on both tracks in gradual turns and permit feathered or pivot turns.

5. Separate reverse lever for quick change of direction of travel in any of the eight transmission speeds.

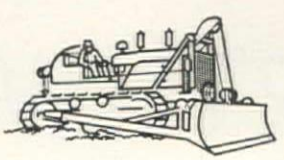
6. High-speed track assemblies with new recoil mechanism that holds front idlers in position against full-load track pull.

The NEW TD-24

CRAWLER TRACTORS • WHEEL TRACTORS

DIESEL ENGINES • POWER UNITS

Standardize on Power that Pays



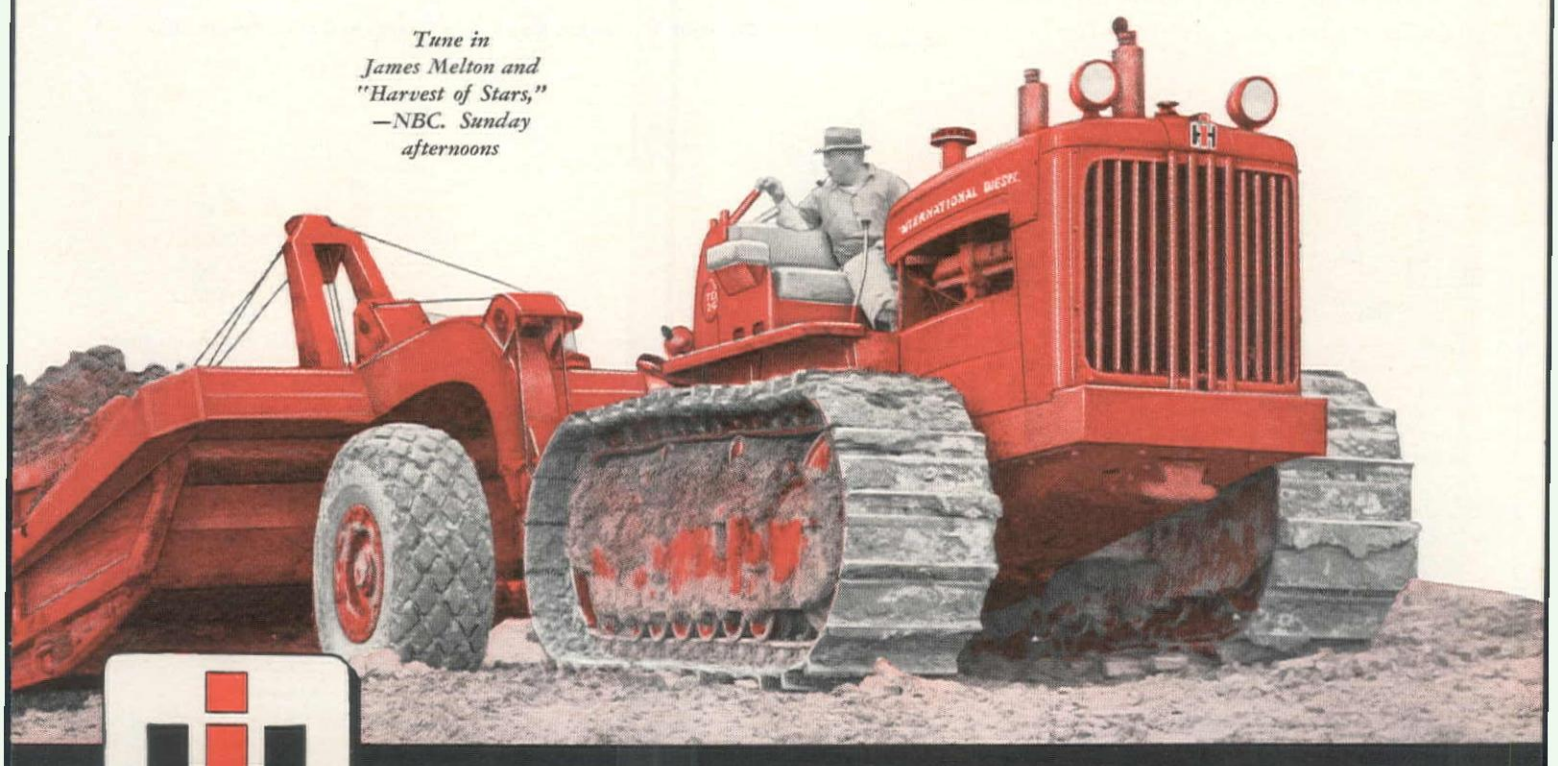
# of Crawlers

TRACTOR ON ANY JOB

● *"THE TD-24 is definitely outhauling every other tractor on the job. It will do so much work that we are sure our job costs will show a great saving!"* That's the report of the foreman on the 247,000-yd. University of Maryland stadium project. • *"I don't have to stop on any grade,"* the operator reports, *"and we have 25% or better on this job. Why, I just go up in 4th gear easy while the other tractors have to switch to low to make it."* And the TD-24 hauls a 17-yard scraper, heaped! • Yes, the TD-24 is the "workin'est tractor" on any job. Yet, its operator is the worker with the easiest day! See your International Industrial Power Distributor. Get a TD-24 demonstration. Discover how you, too, can save job time, cut costs, earn extra profits.

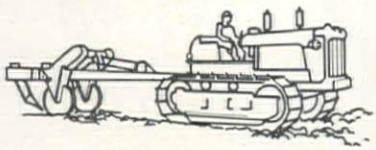
INTERNATIONAL HARVESTER COMPANY • Chicago

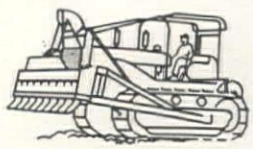
Tune in James Melton and "Harvest of Stars," —NBC. Sunday afternoons



INTERNATIONAL HARVESTER

INTERNATIONAL
INDUSTRIAL POWER





GREAT GRADERS

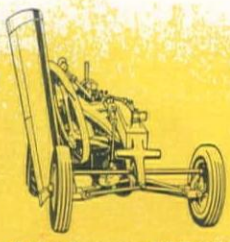
THERE'S no guessing about the performance of "Cat" Diesel Motor Graders with John S. Pukrop, Contractor, Ivanhoe, Minnesota. He knows from experience that these husky yellow machines deliver 60-minute hours day after day. And that's half the battle in figuring and making profits on a job.

Here you see his "Cat" Diesel No. 12 Motor Grader busy on Pipestone County Highway No. 4 near Ruthton, Minn. Right on the heels of rough grading, it's finish grading 9.5 miles of 30-ft. highway. There's no time lost making repeated passes – the No. 12's positive controls keep the tough blade on the beam. But let's get the overall picture directly from Mr. Pukrop, who says: "In my book the No. 12 is the best of all graders and most economical to operate. It has many uses, of course, but we use it for grade finishing. Two miles per 10-hour day is the average, but it could do more if the rough grade was far enough ahead. 'Caterpillar' machines are by far the best on the market."

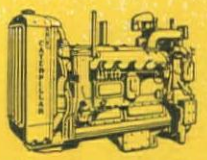
Whatever the grading job, there's a "Cat" Diesel Motor Grader the right size to do it most efficiently and economically for you. And there's a capable "Caterpillar" dealer near-by who's ready round the clock to give you "Johnny-on-the-spot" service. He sincerely believes this rugged yellow machine is the best in the field. Ask him for full proof of its performance!

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

Only "Caterpillar" designs and builds *every* part of the famous "Cat" Motor Graders. This undivided responsibility is your assurance of a long life of efficient, economical performance.



Each of the 3 sizes of "Cat" Motor Graders is a completely different machine. There's no performance penalty due to *excessive frame weight*, too little power or poorly matched working parts.



Only "Caterpillar" Motor Graders have the dependable yellow engines—the power plants that are world famous for delivering 60-minute-hour performance every hour day in and day out.

Lubricating oil is cooled in this radiator section to minimize carbon lacquer and gum formations — enemies of long engine life. Lower temperatures preserve the lubricating qualities of the oil.

Safe and sure Diesel starts are assured by this electrically started gasoline engine. It warms the coolant and allows the Diesel to circulate "lube" oil before actual starting.

Castings like this cylinder head on "Cat" Diesels are made right in "Caterpillar's" own foundry, where tolerances and quality can be closely controlled — another example of precision engineering!

CATERPILLAR

REG. U. S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS

...and here's the proof!

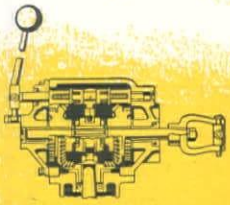
This "Cat" Diesel No. 12 Motor Grader is one of the fleet of "Caterpillar" equipment owned by John S. Pukrop, Contractor, Ivanhoe, Minn. Other big yellow machines include five D8 Tractors, two D7 Tractors, a DW10 wheel-type Tractor and No. 10 Scraper.

Typical of "Caterpillar" quality are these aluminum alloy pistons. Tops are oil sprayed for coolness and long life. Cast iron compression-ring belt keeps this vital ring working at top efficiency.

"Caterpillar"-built fuel injection equipment is trouble-free and fool-proof. Injection capsules and pumps can be replaced on the spot in the field — no adjustments are necessary.

Exclusively "Caterpillar," these solid aluminum "con" rod bearings give low rate of wear, ability to carry heavier loads, exceptional heat transfer characteristics and high corrosion resistance.

"Caterpillar" Motor Graders are designed for exceptionally good operator visibility. Sitting down, the operator can see toe and heel of the blade with equal ease. That helps keep jobs moving.



Mechanically operated controls give the user the constant control that is so necessary for precision work. They're quality built — changes in temperature do not affect them.

"Caterpillar's" exclusive side-shift mechanism allows extreme blade positions without the need for manual adjustment of linkage. You'll find this a real work- and time-saver on the job.

DIESEL

EARTHMOVING EQUIPMENT

Ask your dealer for a demonstration! Ask him for a showing of the new film, "Better Blading"!

What Is Long Haul Dirt?

The BIG Makes Crawler

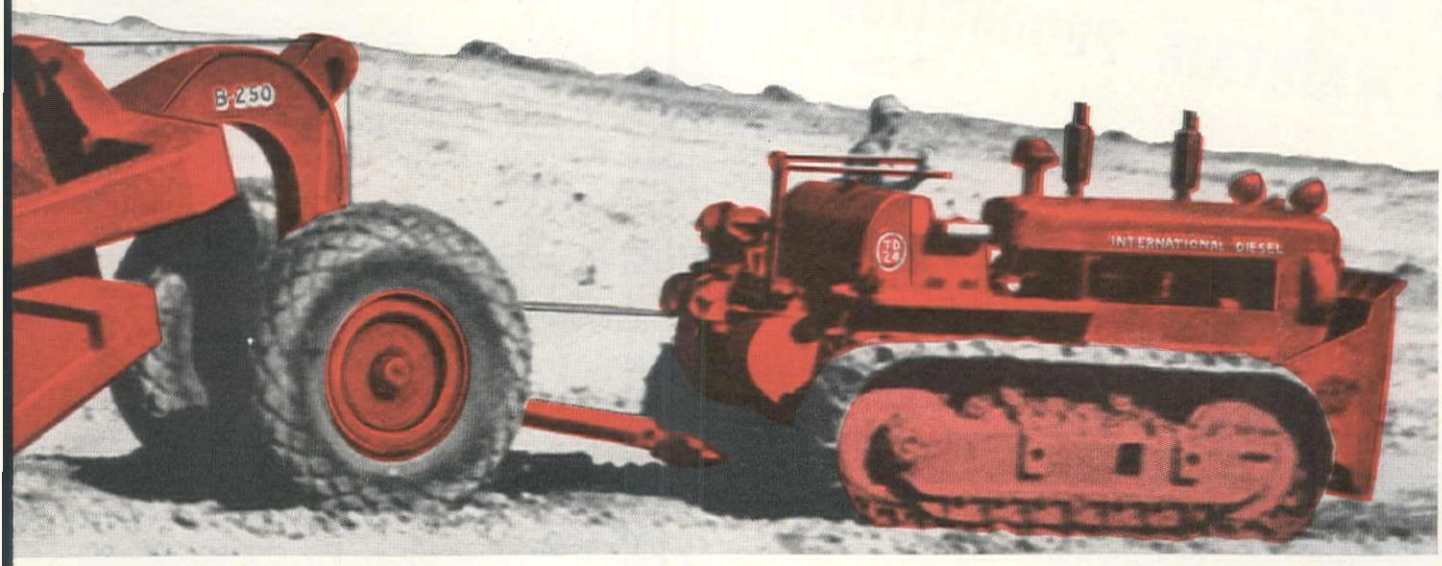
THE matched combination of an International TD-24 tractor and Bucyrus-Erie B-170 or B-250 scraper greatly extends the profitable limits of crawler tractor hauling. The BIG RED team loads more dirt, hauls it faster, dumps it more quickly, and returns on a shorter time cycle than any other crawler tractor-scraper combination.

It outperforms rubber-tired outfits, too, on much longer hauls than has generally been accepted. It works more days per year, stays on the job under conditions that stop rubber-tired equipment—bad weather, wet and slippery haul roads, wet fills. It cuts costs over rubber-tired units because

See Your INTERNATIONAL

RED Team Hauling Pay

Matched for Championship Dirt Moving



it eliminates the cost of supplementary power for loading and dumping, does away with the cost of maintaining haul roads. Its greater yardage, bigger percentage of total working time, and greater economy more than compensate for the added speed of so-called "long haul" equipment.

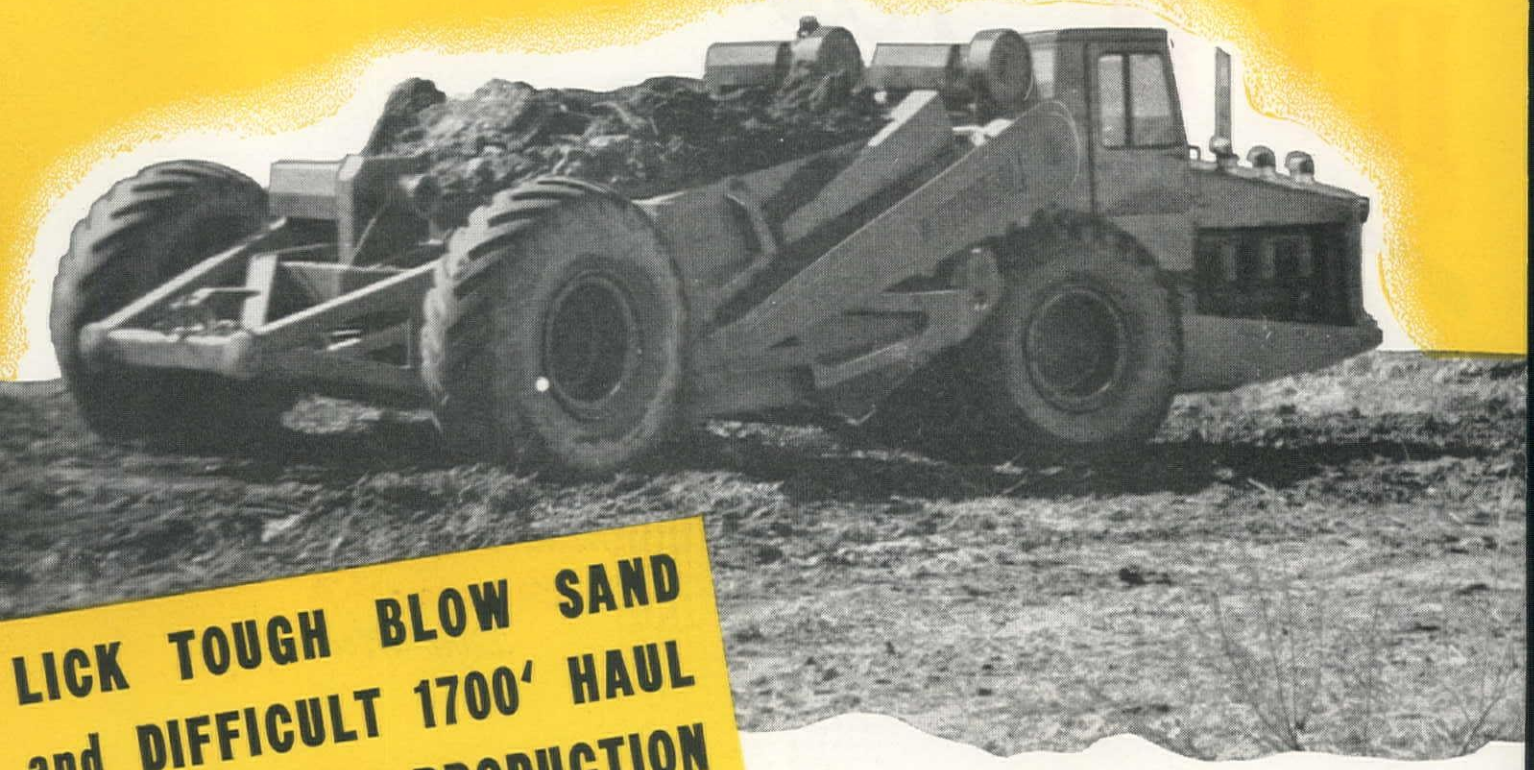
The BIG RED team, matched for championship dirt moving, revolutionizes the conception of crawler tractor-scraper possibilities for low cost dirt. Let us prove it to you!

187T50C

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

Industrial Tractor Distributor

TOURNAPULLS speed New Mexico



LICK TOUGH BLOW SAND and DIFFICULT 1700' HAUL TO MAINTAIN PRODUCTION

On highway construction near Belen, New Mexico, Contractor Henry Thygesen of Albuquerque, is working cuts and fills in the loosest kind of blow-sand. To cut costs in the abrasive materials, and assure steady, high-speed production, Thygesen put 2 veteran, rubber-tired Super C Tournapulls on the job . . . then added a new, electric-control C Tournapull for extra yardage output.

1700' round trip every 7½ minutes

Cuts are sprinkled constantly to facilitate loading of the dry blow-sand. Loose, powdery footing on the haul roads, with soft, spongy spots in many places, hold Tournapull travel to 3rd gear. Yet, Thygesen's new electric-controlled "C" easily maintained 7 trips an hour on 850-foot, one-way hauls. Sprinkling the cut paid off in better production . . . with the C Tournapull getting heaped loads in an average of 1 minute.

Exclusive features increase output

Like Contractor Thygesen, many progressive dirtmovers are modernizing their equipment fleets with the latest electric-control C Tournapulls because: lugging ability of power-proportioning differential cuts weather delays . . . keeps big pay loads rolling through deep sand, mud and up steep grades. High-speed travel and flotation advantages of big 21.00 x 25 low-pressure tires, plus fast 90° turns, give higher average speed cycles. Positive power steer and easy, finger-tip electric controls keep operators working at top efficiency right up to the end of shift. Result for *you* . . . a *new* lowest-net-cost-per-yard.

Get all the facts. Ask your LeTourneau Distributor about C Tournapulls TODAY!

Carryall-Trademark Reg. U.S. Pat. Off. R157w

LeTOURNEAU LET EQUIPMENT

Send to: **R. G. LeTOURNEAU, Inc., Peoria, Illinois,** or to your local LeT Distributor listed on opposite page, for complete information on new, 30 m.p.h. C Roadster-type Tournapull for use with:

NAME..... TITLE.....
COMPANY.....
STREET.....
CITY..... STATE.....
Type work to be handled.....

- ☐ 13.5 cu. yd. Carryall Scraper
- ☐ 17 cu. yd. rear-dump Tournarocker
- ☐ 15 cu. yd. bottom-dump Tournahopper

highway for *Henry Thygesen*

Your LeTourneau Distributor

HAS MANY MORE STORIES LIKE THIS . . . ASK FOR THEM!

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TOURNADOZERS* TOURNAPULLS* TOURNAROCKERS** TOURNAHOPPERS**

MORE YARDS PER HOUR WITH RUBBER-TIRED POWER

Barber-Greene

Sensational

NEW CAR UNLOADING TEAM!

unloads car of rock or crushed stone in 45 minutes

358 B-G HOPPER CAR UNLOADER

Here's a rugged all-material unloader that's completely new in design. The 358 cuts hopper car unloading time as much as 90%—unloads most any bulk product from fine sandy material to large-sized rock aggregates at capacities up to 3 tons per minute—empties a 60-ton car in as little as 45 minutes without jam-ups or delays. There's *positive material flow at all times.* Easily "spotted" in track pit or above rails—really portable—can be towed at normal traffic speeds.

363 B-G PORTABLE CONVEYOR

The newly designed B-G Model 363 Portable Conveyor is an extremely flexible machine that will prove to be profitable to yards, industrial plants, contractors, etc. Speeds up stockpiling or transfer of material from car or stock pile to trucks. Entirely new in design, the 363 features V belt drives, pneumatic tires, shock absorbers, towing hitch, and a host of *new* improvements. Send for new attractive literature on these two great B-G machines.

84

BARBER · GREENE COMPANY · AURORA, ILLINOIS

FOR SALE BY:

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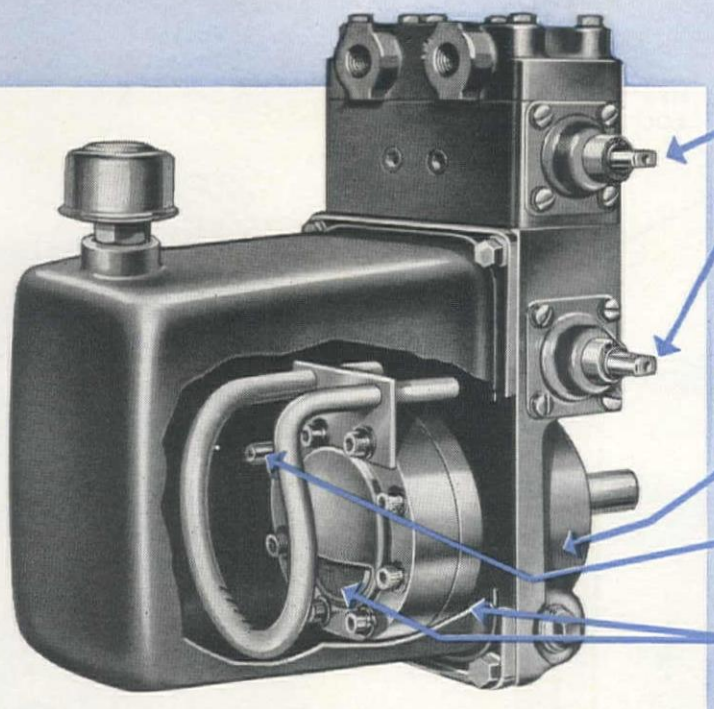
VICKERS *Hydraulic* POWER PACK



Control Valves for One or More Operations

Balanced Vane Pump for Power

Relief Valve for Overload Protection

Oil Reservoir and Filter

PROVEN AND DEPENDABLE HYDRAULIC POWER

All in a SINGLE, COMPACT PACKAGE

It will PUSH, PULL LIFT, LOWER or HOLD *at a Finger-Touch*

The Vickers Hydraulic Power Pack has a number of important advantages over the ordinary hydraulic pump that recommend it to equipment manufacturers and users alike. For example: the included Vickers Vane Pump is hydraulically balanced to eliminate bearing loads resulting from pressure and assure long and trouble-free service life. It has automatic wear compensation, and ideal running clearances are always maintained. All continuously moving parts are contained in pump cartridge which is easily removed without disturbing piping or drive coupling.

Overload protection is automatic and foolproof through a built-in relief valve. Operators can work fast and crowd hard without fear of damage. Universal mounting makes for quick, easy installation. Bulletin 46-48 explains the many other advantages of the Vickers Power Pack; ask for a copy.

VICKERS Incorporated

DIVISION OF THE SPERRY CORPORATION

1498 OAKMAN BLVD. • DETROIT 32, MICH.

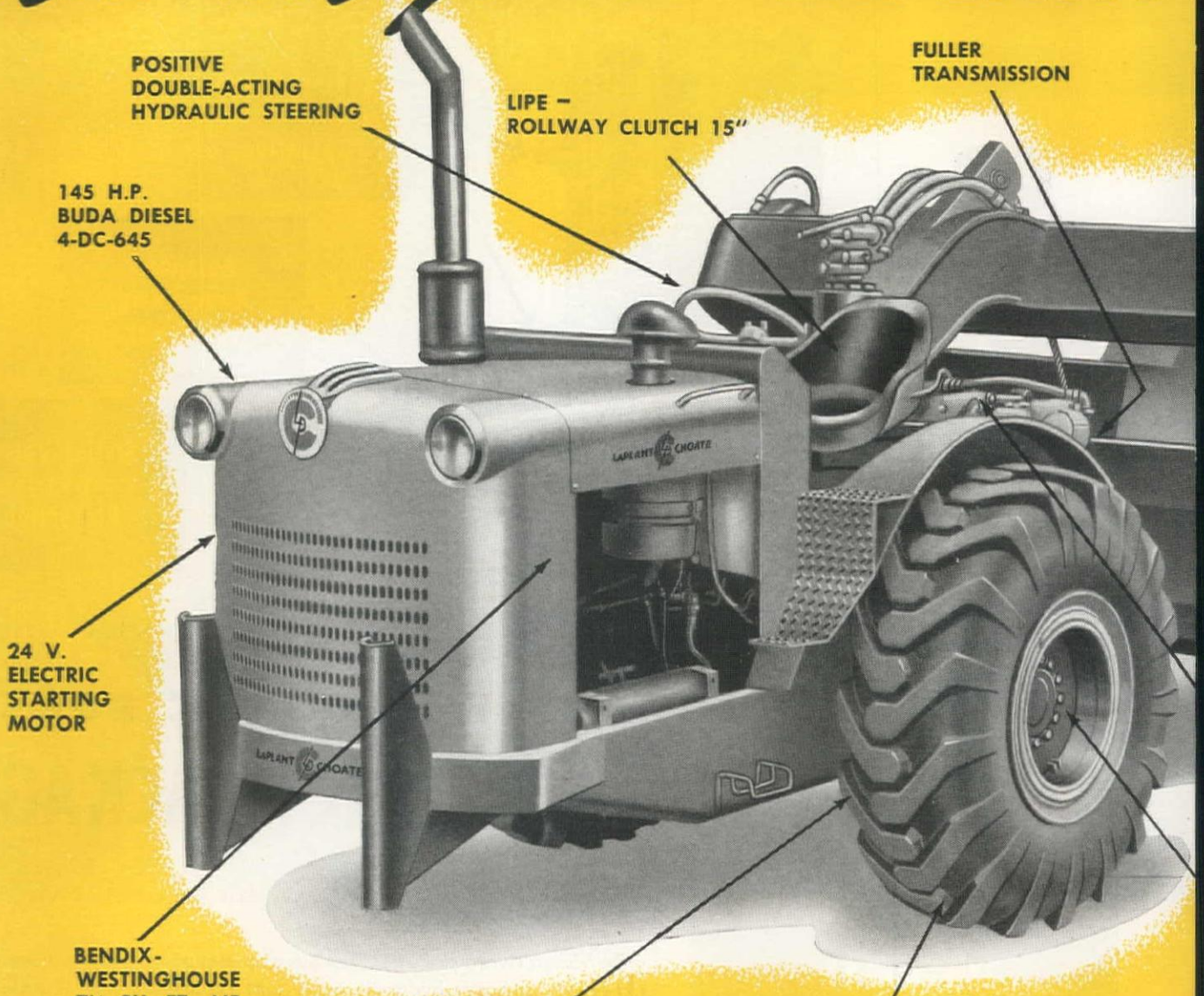
Application Engineering Offices: **ATLANTA • CHICAGO • CINCINNATI • CLEVELAND • DETROIT HOUSTON • LOS ANGELES (Metropolitan) • MILWAUKEE • NEW YORK (Metropolitan) • PHILADELPHIA PITTSBURGH • ROCHESTER • ROCKFORD • ST. LOUIS • SEATTLE • TULSA • WASHINGTON • WORCESTER**

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

write for BULLETIN 46-48

Vickers Hydraulic Power Pack is Saving Labor and Reducing Costs on Agricultural Implements, Construction Machinery, Materials Handling Equipment, and Industrial Machinery

Another great LaPLANT



LaPLANT-CHOATE

EARTHMOVING EQUIPMENT

INDUSTRIAL EQUIPMENT COMPANY
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LaPLANT-CHOATE SALES AND SERVICE
1022 - 77th Avenue OAKLAND, CALIFORNIA

WESTERN EQUIPMENT COMPANY
P. O. Box 2196
3400 E. Olive Street SPOKANE, WASHINGTON

Get the facts from your

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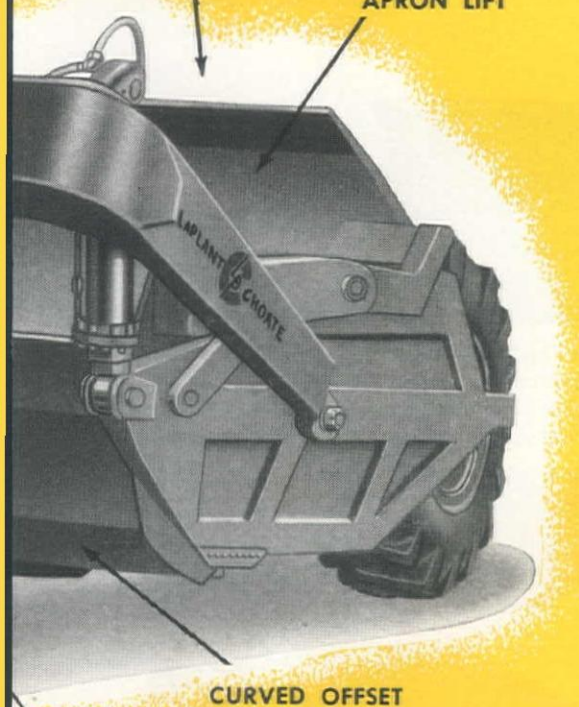
1240 S. E. 12th Ave. PORTLAND, OREGON
5030 1st Ave. South SEATTLE, WASHINGTON

ENGINEERING SALES SERVICE, INC.
410 Capitol Boulevard BOISE, IDAHO

-CHOATE MOTOR SCRAPER

BIG CAPACITY
9 CU. YDS. STRUCK
12 CU. YDS. HEAPED

POSITIVE FORCED EJECTION *PLUS* HIGH APRON LIFT



CURVED OFFSET CUTTING EDGE

DUAL LPC FLUID POWER UNIT — FOR STEERING AND SCRAPER OPERATION

4-WHEEL TIMKEN-DETROIT AIR BRAKES

The new TS200

HERE'S another unit in the famous LPC line of profit-makers—a 9 to 12 yard high-speed earthmover—hydraulically controlled.

Speedy, agile and powerful, the "200" is small enough for all those small yardage odd jobs and utility work and yet has all the capacity and speed necessary for real high production earthmoving on those long haul jobs.

In the TS200 you get all those extra profit-making features that made the TS300 so popular—Big, rugged power, over 16 H.P. per struck yard of capacity—High speed, over 23 MPH (27.4 with optional transmission). Positive double-acting hydraulic steering and big, safe sure-stopping 4-wheel air brakes.

For BIG returns on a SMALL investment look to the "200". See your nearest LPC distributor now. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa — LaPlant-Choate Sales and Service, 1022 77th Ave., Oakland, Calif.

FAMOUS LA PLANT-CHOATE DOZERS
Both angling and straight blade — again available in either hydraulic or cable operated types. See your LPC distributor now!

nearest LPC distributor

WESTERN CONSTRUCTION EQUIPMENT CO.
505 N. 24th Street, BILLINGS, MONTANA
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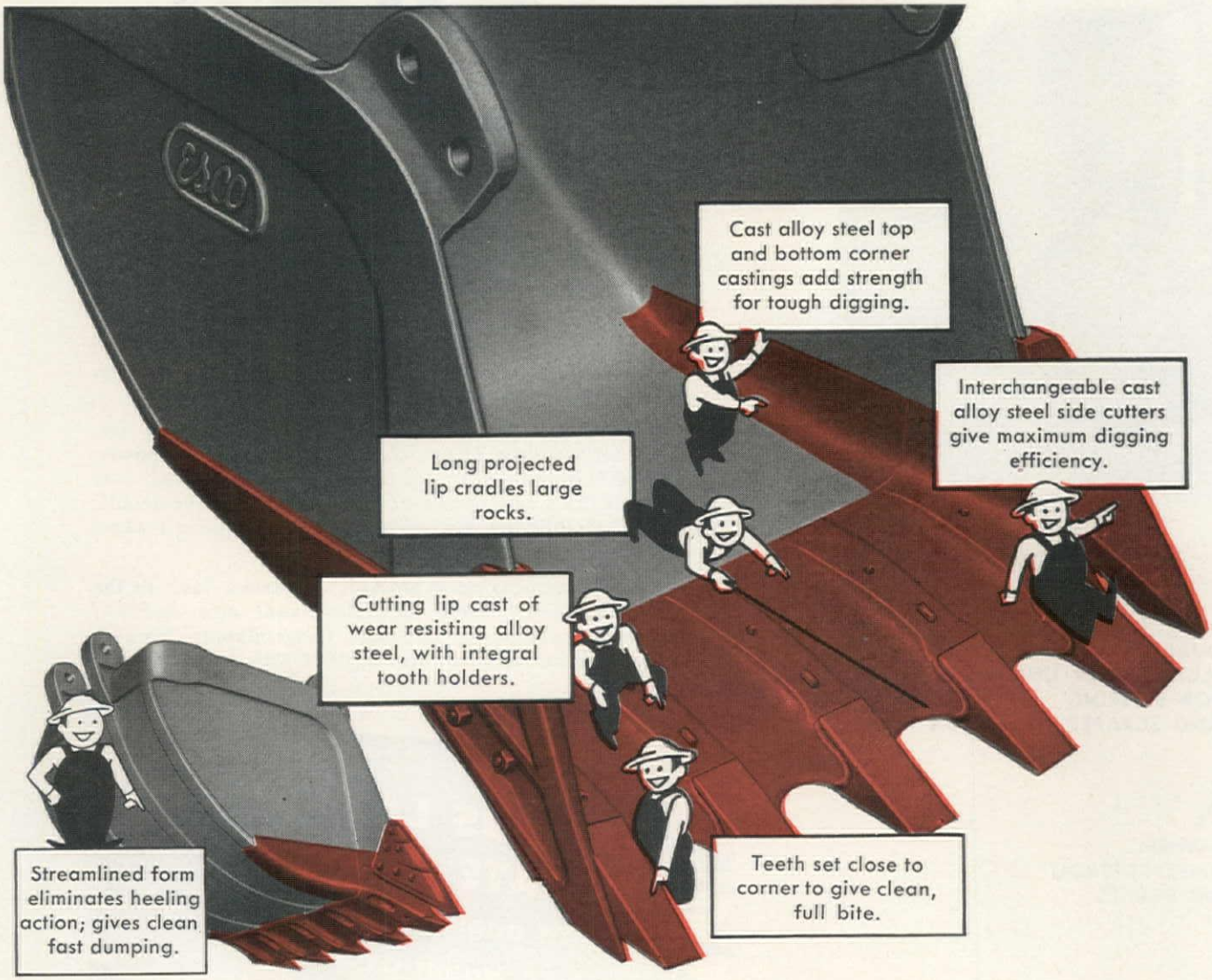
N. C. RIBBLE CO.
1304 N. Fourth Street ALBUQUERQUE, NEW MEXICO

Designed for FAST DIGGING...*Built for* HARD WORK

Thoroughly tested on the proving ground and on the job, the pull shovel dipper shown here is the newest addition to the *ESCO* line of earth moving equipment.

Design is the result of thorough research, and engineering experience gained through making punishment-taking dragline and dipper buckets over a period of many years. Alloy steels used throughout the dipper are specified for maximum resistance to wear and shock.

Sizes range from 3/8 to 2½ yards. For additional information on the *ESCO* pull shovel dipper, see your nearest *ESCO* representative, or fill in and mail the coupon.



ESCO DIPPER AND DRAGLINE BUCKETS

ELECTRIC STEEL FOUNDRY

2163 N. W. 25th Avenue, Portland 10, OREGON

SALES OFFICES AND WAREHOUSES:

CHICAGO, ILL.	LOS ANGELES, CALIF.
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HOUSTON, TEXAS	SEATTLE, WASH.

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IN CANADA — ESCO LIMITED, VANCOUVER, B.C.

ELECTRIC STEEL FOUNDRY
2163 N.W. 25th Avenue, Portland 10, Oregon

Please send me your bulletin on the new ESCO Hoe Dippers.

Name_____

Address_____

City_____

Zone_____ State_____

Make and Model of Machine_____

OF THE THOUSANDS BUILT...

9 out of 11 "Eucs"

ARE STILL IN USE TODAY!

REAR-DUMP EUCLIDS
Payload capacities range from 10 to 34 tons. Top speeds with full payload up to 35.7 m.p.h.

The record proves that Euclids have the rugged strength and stamina to perform profitably year after year in heavy off-the-highway service.

Euclids are job proved... they've earned their reputation for staying power, low-cost production, and continuous operation on the toughest jobs. They're built to "take it"... designed for long life and dependable performance in mines, quarries and heavy construction.

The world-wide Euclid distributor organization assures fast, efficient service to all owners. Plan now to use long-life, profit making Euclids for your present and future off-the-highway work.

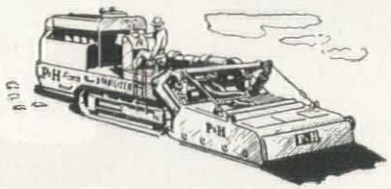
BOTTOM-DUMP EUCLIDS
13 to 25 cu. yds.—20 to 40-ton capacities. Top speeds loaded up to 34.4 m.p.h.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

EUCLIDS *Move the Earth*

P&H SINGLE PASS SOIL STABILIZER

the Inside Story of better, more uniform roads!



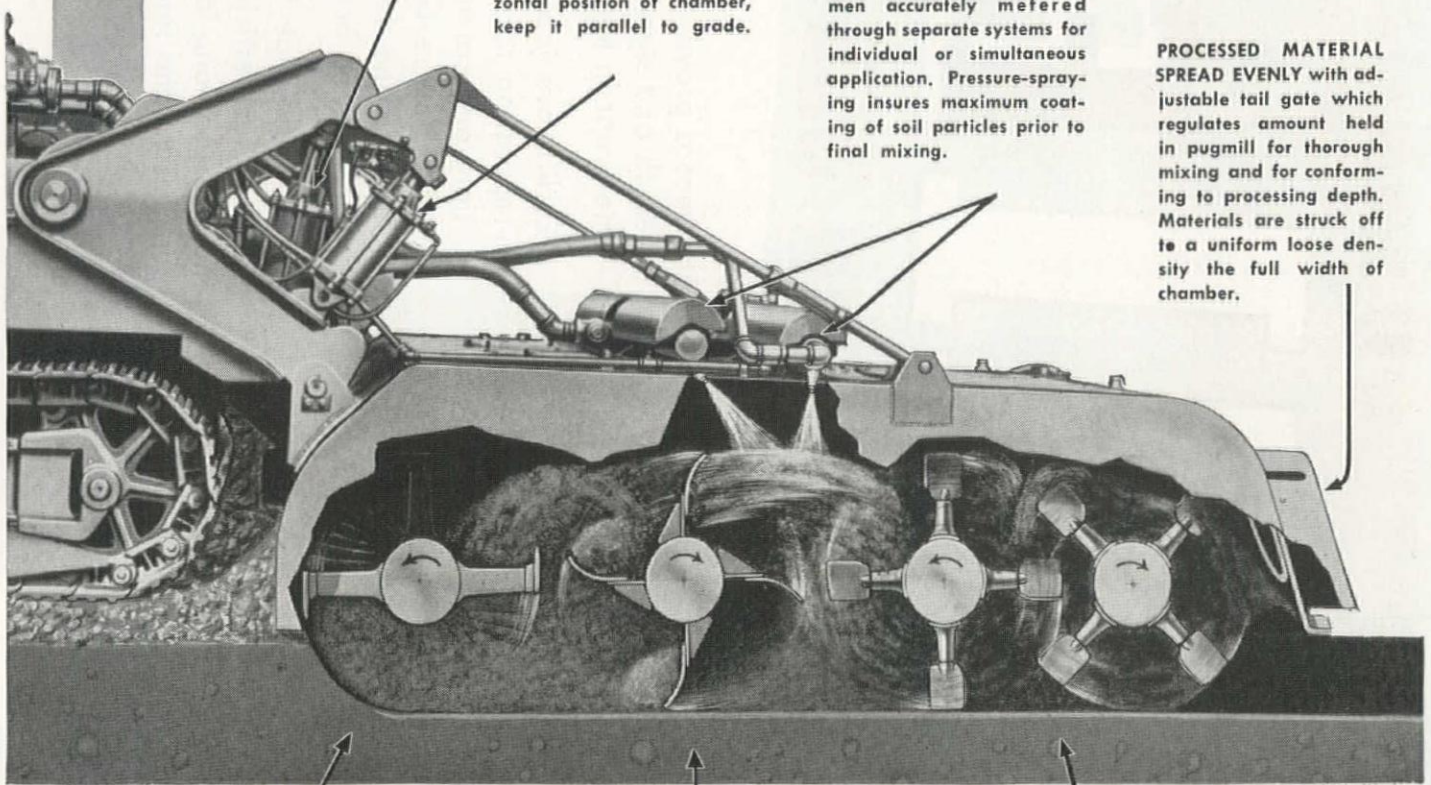
This is the processing chamber of the P&H Soil Stabilizer. Here, all processing operations — digging, pulverizing, blending and mixing of native soils with any type of admixture — are performed. Right here, the 8 basic requirements for successful soil stabilization are fulfilled. Years of development and practical use prove the remarkable ability of the P&H Soil Stabilizer to produce roads of uniform high quality — faster — and at lower cost.

PRIMARY HYDRAULIC CYLINDERS raise and lower the process chamber to accurately maintain depth of cut.

SECONDARY HYDRAULIC CYLINDERS regulate horizontal position of chamber, keep it parallel to grade.

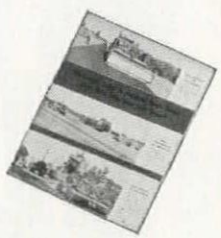
LIQUIDS UNIFORMLY APPLIED with water or bitumen accurately metered through separate systems for individual or simultaneous application. Pressure-spraying insures maximum coating of soil particles prior to final mixing.

PROCESSED MATERIAL SPREAD EVENLY with adjustable tail gate which regulates amount held in pugmill for thorough mixing and for conforming to processing depth. Materials are struck off to a uniform loose density the full width of chamber.



NEW BULLETIN!

See how the P&H Soil Stabilizer is reducing time and costs in building uniform, high quality roads and airports in states all over the country. Ask for Bulletin S-8 of job facts and figures!



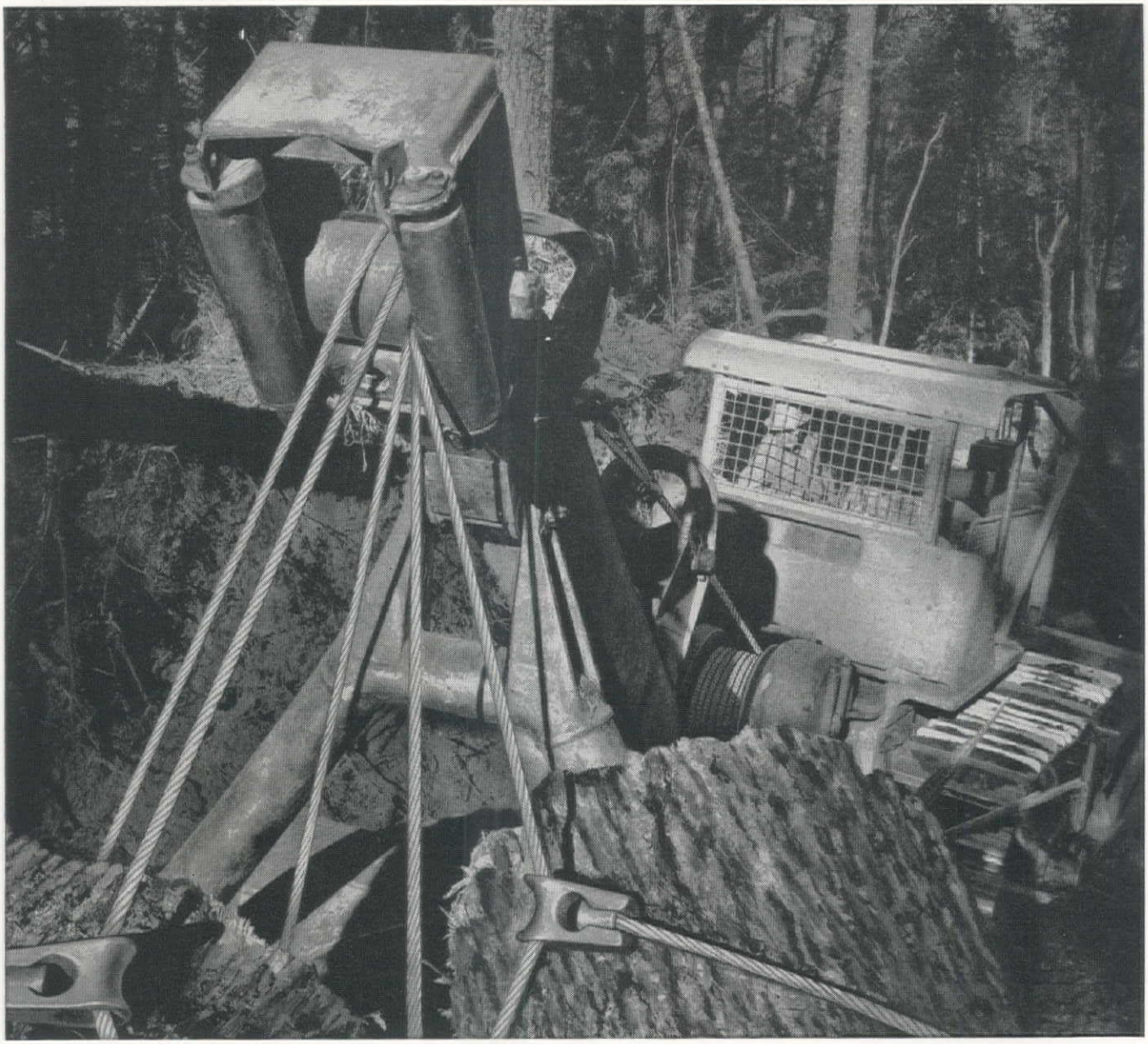
P&H
SINGLE PASS SOIL STABILIZERS
4490 West National Avenue
Milwaukee 14, Wisconsin
HARNISCHFEGER CORPORATION

Excavators • Overhead Cranes • Hoists • Arc Welders and Electrodes • Soil Stabilizers • Crawler and Truck Cranes • Diesel Engines • Cane Loaders • Homes

HIGH SPEED CUTTING ROTOR cuts and pulverizes small increments as the Stabilizer travels forward. The hard surfaced rotor teeth are quickly replaceable.

BLENDING ROTOR picks up loose materials and trims subgrade. Opposite rotation to cutting rotor shuttles material back and forth and casts it in a uniformly thin layer through the liquid spray.

PUGMILL MIXING is accomplished by twin transverse mills with wide faced paddles rotating in opposite directions. Rubbing and squeezing action insures a thorough mix.



Tractor arch logging using Tiger Brand Wire Rope at Jensen Lumber Co., Willits, California.

Tiger Brand Wire Rope is manufactured from raw ore to finished product under the strict quality controls of United States Steel. To help you get all the stamina engineered into American Tiger Brand, the services of a Field Specialist are available without charge.

Contact your Tiger Brand distributor or write Columbia Steel Company, Room 1422, Russ Bldg., San Francisco 4.

U·S·S TIGER BRAND Wire Rope

UNITED STATES STEEL

TUBE BORIUM and BOROD give you the edge

Pole settings and footings go down regardless of winter freezes with these auger cutters, tipped with Borod and Tube Borium. So enduring is the abrasion resistance of these Stoody hard metals that one operator reports drilling thirty-three 16″ footing holes to a depth of 6 feet through flint-hard frozen gumbo soil in just 2½ hours! Another drilled for and set over 100 poles in one hot day!

Tube Borium and Borod insure 12 month a year operation on the auger illustrated. No shut downs for winter freezes, no lost time for frequent cutter changes! Quick penetration through dry hard packs, shale, clay, gumbo, tree roots, even gravel.

If extreme earth abrasion and maintenance of sharp cutting edges is your wear problem, ask for BOROD or TUBE BORIUM*. Your Stoody dealer will gladly recommend correct application methods or write direct.

STOODY COMPANY

11956 EAST SLAUSON AVENUE, WHITTIER, CALIFORNIA

* *Borod and Tube Borium consist of pure tungsten carbide particles in mild steel tubes. They differ primarily in size of particles, Borod being much finer and smoother in finished deposit. Both rods are typified by unusual resistance to straight abrasion.*

Ford

INDUSTRIAL ENGINE Service

where you want it

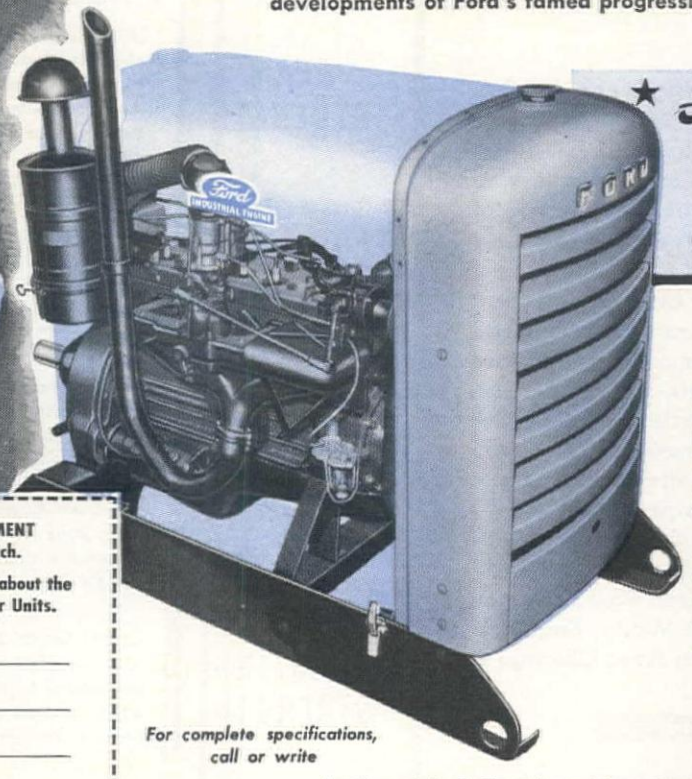
Equipment builders and users of industrial engines know that one of the most important keys to profitable operations is adequate and convenient service facilities.

Your product may be outstanding in design and performance, but if your owners have to search for service, wait long periods for replacement parts—you have a *real* problem on your hands.

When you specify Ford Industrial Engines as standard power for your equipment, you have your field service problem automatically solved. For Ford Industrial Engine Service is as near as the nearest Ford Dealer—clear around the world!

And that's just one of the 3 big reasons* why smart equipment builders know Ford Industrial Engines add a real profit-plus to their applications.

*** The other two? One—the *RIGHT* power; a choice of five great engines. Two—the *RIGHT* features—the latest developments of Ford's famed progressive engineering.**



★ **Ford "226" POWER UNIT**
6 cylinder, 226 cu. in. displacement
(Also available in open type power unit or engine assembly only)

Ford Industrial Engines are offered as complete power units, or as individual engine assemblies. Both are available with a wide variety of special attachments. They are made in the following types and sizes:

- ★ 120 CU. IN. 4 CYLINDER
- ★ 226 CU. IN. 6 CYLINDER
- ★ 254 CU. IN. 6 CYLINDER
- ★ 239 CU. IN. V-TYPE 8 CYLINDER
- ★ 337 CU. IN. V-TYPE 8 CYLINDER

INDUSTRIAL ENGINE DEPARTMENT
Ford Motor Co., Dearborn, Mich.

Send me comprehensive literature about the new Ford Industrial Engine Power Units.

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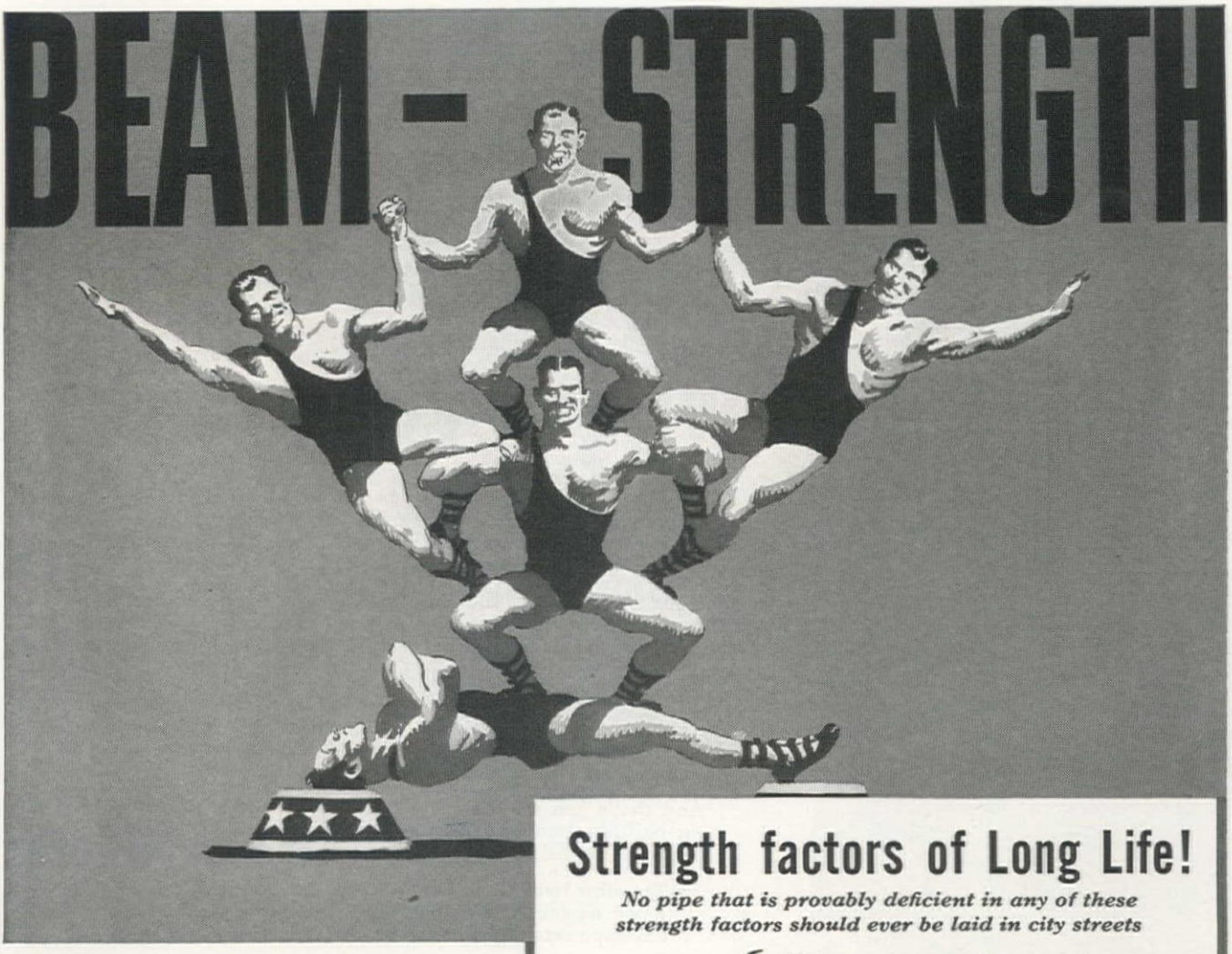
Clip and Mail This Coupon Now!

For complete specifications, call or write

Industrial Engine Department
FORD MOTOR COMPANY
DEARBORN, MICHIGAN

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED

BEAM - STRENGTH



Strength factors of Long Life!

No pipe that is provably deficient in any of these strength factors should ever be laid in city streets

BEAM STRENGTH — When cast iron pipe is subjected to beam stress caused by soil settlement, or disturbance of soil by other utilities, or resting on an obstruction, tests prove that standard 6-inch cast iron pipe in 10-foot span sustains a load of 15,000 lbs.

CRUSHING STRENGTH — The ability of cast iron pipe to withstand external loads imposed by heavy fill and unusual traffic loads is proved by the Ring Compression Test. Standard 6-inch cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

SHOCK STRENGTH — The toughness of cast iron pipe which enables it to withstand impact and traffic shocks, as well as the hazards in handling, is demonstrated by the Impact Test. While under hydrostatic pressure and the heavy blows from a 50 pound hammer, standard 6-inch cast iron pipe does not crack until the hammer is dropped 6 times *on the same spot* from progressively increased heights of 6 inches.

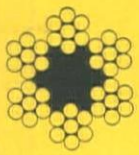
BURSTING STRENGTH — In full length bursting tests standard 6-inch cast iron pipe withstands more than 2500 lbs. per square inch internal hydrostatic pressure, which proves ample ability to resist water-hammer or unusual working pressures.

Without beam strength—or, for that matter—without all of the strength factors listed opposite—no pipe laid 100 years ago in *city streets* would be in service today. But, in spite of the evolution of traffic from horse-drawn vehicles to heavy trucks and buses—and today's vast complexity of subway and underground utility services—cast iron gas and water mains, laid over a century ago, are serving in the streets of more than 30 cities in the United States and Canada. Such service records prove that cast iron pipe combines all the strength factors of long life with ample margins of safety. No pipe that is provably deficient in any of these strength factors should ever be laid in city streets. Cast Iron Pipe Research Association, Thos. F. Wolfe, Engineer, 122 So. Michigan Ave., Chicago 3.

CAST IRON

CAST IRON PIPE SERVES FOR CENTURIES

Whatever the job



6x7 rope is made with 7 wires in each of 6 strands around a fiber core or a steel core. It may be bright or galvanized steel, stainless steel or monel metal. Uses are for haulage, guying, sand lines, core barrel lines, rigging, controls, etc.

7x19 is made with 7 strands of 19 wires each, one strand forms the core. It is widely used for corrosion-resisting wire rope of galvanized steel, stainless steel and monel metal. Widely used for aircraft controls and for miscellaneous hoisting and controls.

6x19 classification is made with wire combinations varying from 16 to 26 wires in each of 6 strands. Supplied *PRE*formed or non-*PRE*-formed, Lang Lay or Regular Lay, with fiber core, or steel core in bright and galvanized steel, stainless steel and monel metal. It is one of the most widely used ropes for general hoisting, cranes, excavating equipment, haulage, mining, logging and rotary drilling. Illustrated is a cross-section of 6x19 filler with I.W.R.C.

select the right wire rope for your equipment from

6x37 group has various types with wire combinations ranging from 26 to 46 wires in each of 6 strands. Supplied *PRE*formed or non-*PRE*-formed, Lang Lay or Regular Lay, with fiber core or steel core. It is extremely flexible and has many uses for hoists, ladle cranes, coal cutting machines, winches, dredges, excavating equipment, etc. Illustrated is a cross-section of 6x41 I.W.R.C.

18x7 is made as illustrated with 18 strands of 7 wires each and supplied *PRE*formed. It is a non-rotating "Kilindo" rope made by combining two opposing lays of rope. Its principal use is for hoisting with a single line to overcome rotating or spinning of the load. It is desirable for small shop and warehouse electric hoists, and for sewer, subway and mine shaft work.

8x19 is an extra flexible rope made in various wire combinations. It is used in iron and special traction grades for passenger and freight elevator service, and in Monarch Whyte Strand Improved Plow Steel for many and varied purposes where the rope is not subjected to heavy crushing loads. Illustrated is 8x19 Seale Special Traction Elevator Rope.

A thousand and one
WIRE ROPES
made by
MACWHYTE

Putting the right wire rope on your equipment puts dollars in your pocket

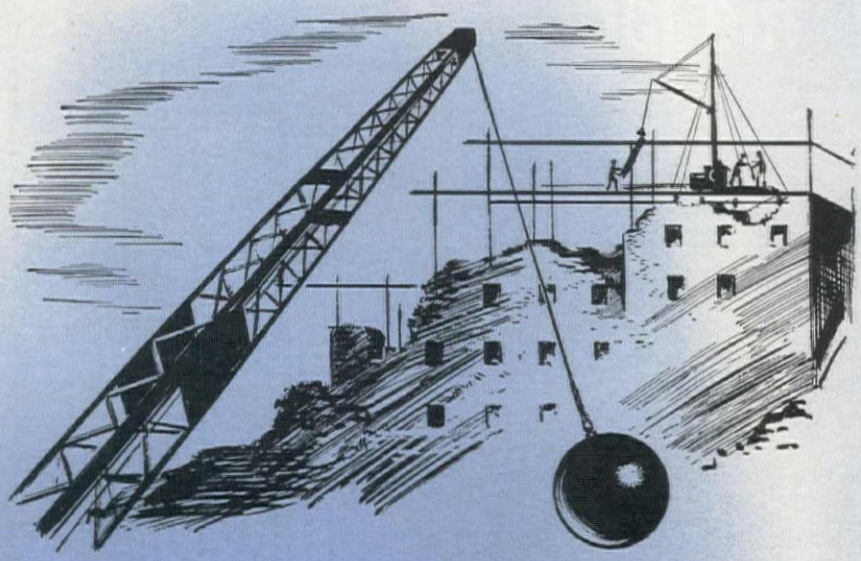
Perhaps you have several uses for wire rope. Perhaps there are several types of rope you could use. But for better service, lowest operating cost, you should get a specific recommendation for each job. Tell us what equipment you have, how you use it, and the size and type of rope you are now using. Take advantage of our specialized wire rope experience with all types of equipment. Get specifications for the correct rope to use on each machine you have. Just call a Macwhyte distributor or write direct to Macwhyte Company, Service Department, Kenosha, Wisconsin.

MACWHYTE COMPANY

Portland · Seattle · San Francisco · Los Angeles

Manufacturers of Monarch Whyte Strand PREformed, Internally Lubricated Wire Rope, ATLAS Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog on request.

Roebling Preformed Lang Lay "Blue Center" Steel Wire Rope lasts longer; brings fewer shut-downs; cuts down replacement time; saves wire rope dollars.



For rope research and developments that help you save...

Today it's Roebling!

YEAR BY YEAR, industry makes new and more stringent demands upon wire rope . . . and Roebling leads in developing types that meet these demands with utmost efficiency and economy.

Take Roebling Preformed "Blue Center" Wire Rope with Independent Wire Rope Core!

No finer rope has ever been made, and its basis is "Blue Center" steel—an exclusive Roebling development. Its high resistance to abrasion, shock and fatigue spells long life . . . To this, Roebling *Preforming* brings the further advantages of new handling ease and improved performance . . . And the addition of I.W.R.C. assures top resistance to operating pressures and provides increased rope strength.

Roebling makes a wire rope of the right construction, grade and size for every type and make of rope-rigged equipment. Have your Roebling Field Man recommend the best rope for low-cost performance on each of your installations.

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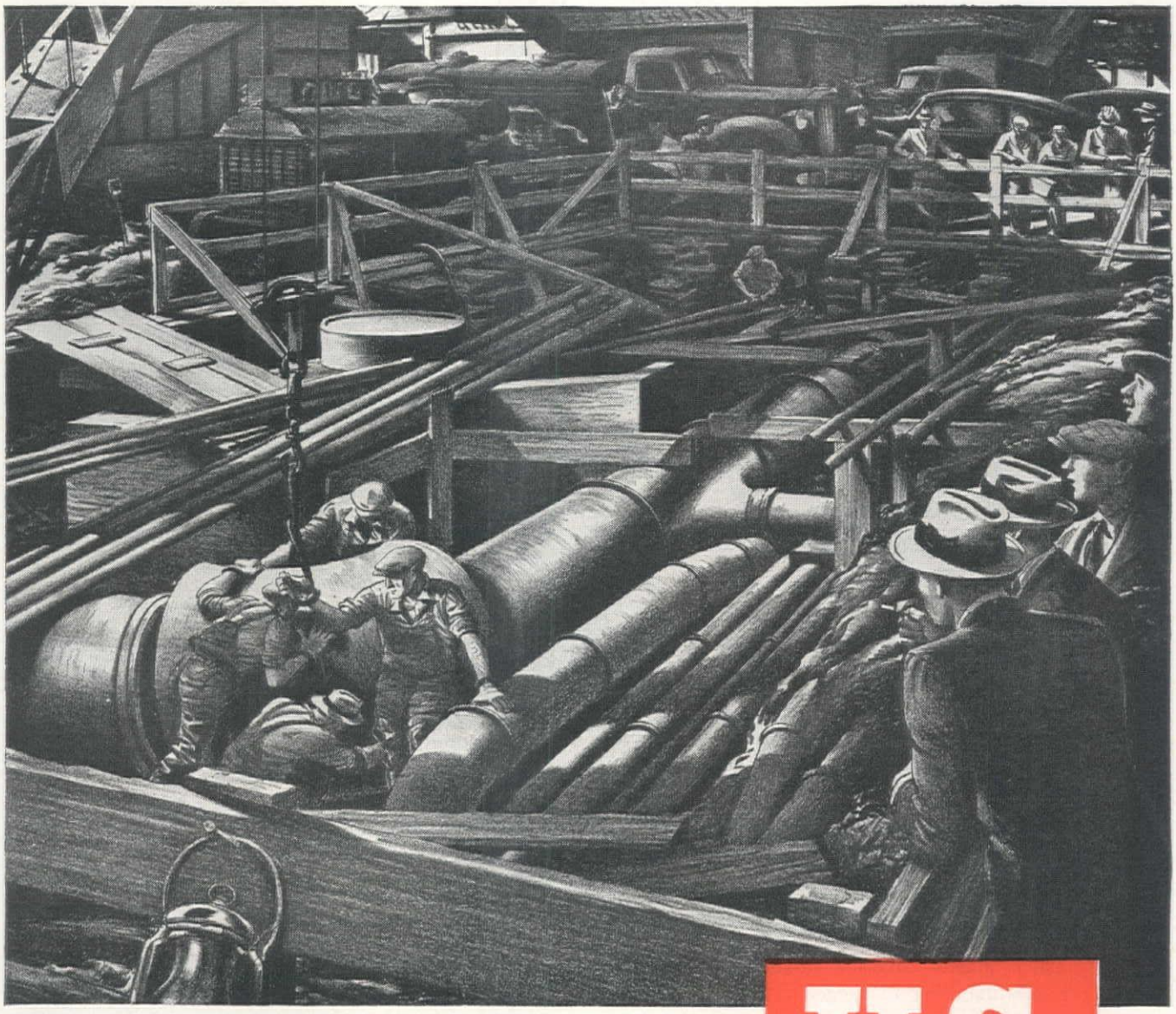
JOHN A. ROEBLING'S SONS COMPANY OF CALIFORNIA
SAN FRANCISCO—LOS ANGELES—SEATTLE—PORTLAND



Lithographed on stone by Edward A. Wilson

U.S. cast iron PIPE

FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

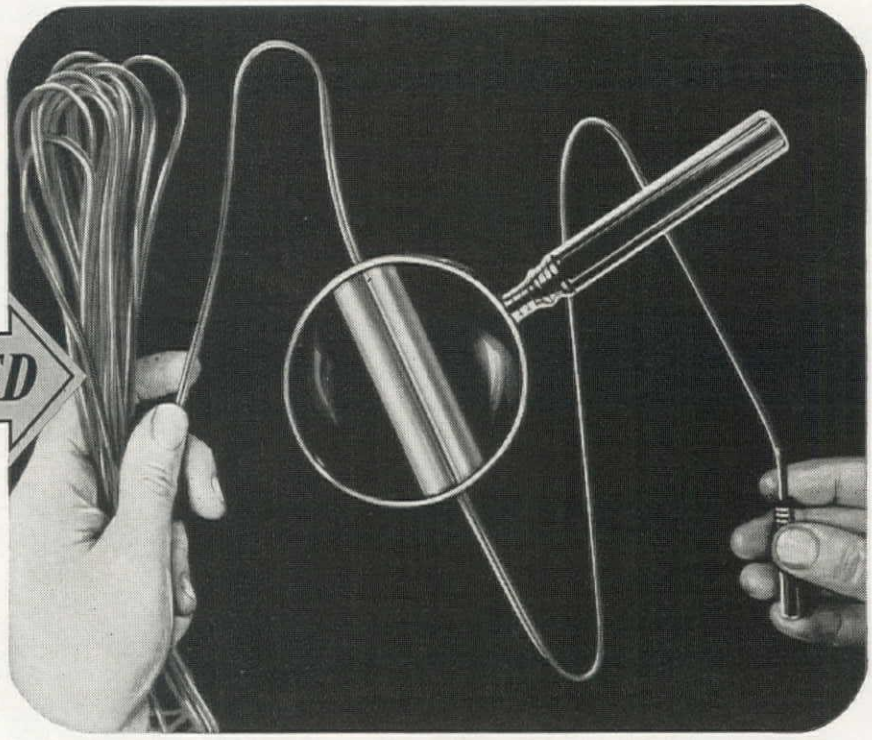
Take the lid off a busy street in any sizeable city! What will you find? A maze of mains—water, gas, and sewer mains—many of them cast iron mains—some of them in service for generations. Traffic shock, earth settlement, or earth disturbance by other utilities, are withstood by cast iron pipe because of its shock strength, beam strength, and crushing strength. These strength factors, plus inherent resistance to corrosion, result in long life and economy. U. S. Cast Iron Pipe and Fittings, produced under modern quality-controls, are readily available in sizes to meet the normal requirements of any community. **United States Pipe and Foundry Company, General Offices: Burlington, New Jersey. Plants and Sales Offices Throughout U. S. A.**

Blasters Agree...

The New ATLAS

PLASTIC-INSULATED

Blasting Cap Wiring



Meets The Most Exacting Demands

Here's why:

1. ***It's really tough—and truly waterproof!*** Thick plastic covering, made to withstand rough handling in jagged bore holes. Fully waterproof. Extremely high insulating value.
2. ***Less kinking and snarling!*** With minimum care, it folds or reels out without tangles or kinks—saves time and tempers in hooking up.
3. ***Flexible at 20° below zero!*** Made to withstand Arctic or Tropic weather.
4. ***Easy on eyes and hands!*** No eye-strain to see the brilliant orange or yellow wire, even in dull light. No rough edges when duplex wire is separated into single strands.
5. ***Stands up to rigid tests!*** Compare it with other wire for these outstanding properties; and also for high tensile and compression strength; resistance to deterioration from weather, rodents, vermin.

You can save time and trouble—that means *money*—on blasting jobs with the new Atlas plastic-covered leg wires and connecting wiring. This latest Atlas contribution to explosives progress comes up to the highest expectations—and more—of men who use electric blasting caps under the roughest field conditions. Now available in duplex on all Atlas Manasite electric blasting caps with wires 30 feet long or more. Two single plastic-covered wires on shorter lengths. Made by the developers of ROCKMASTER, the original split-second delay blasting system.

ROCKMASTER, MANASITE: Reg. U. S. Pat. Off.

Offices in Principal Cities

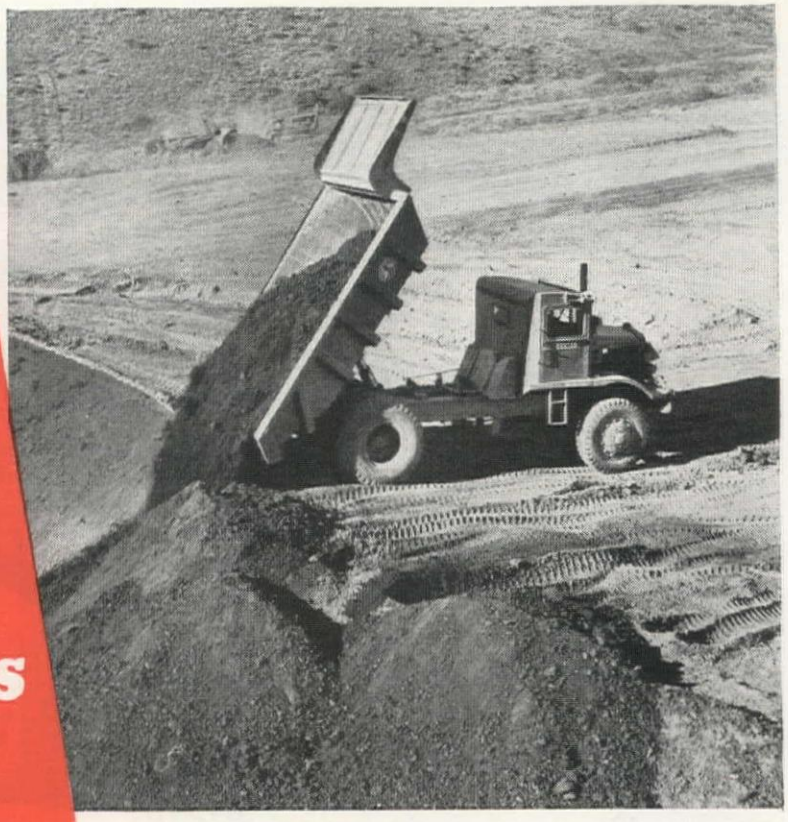
ATLAS EXPLOSIVES

"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

SAN FRANCISCO 4, CAL. ATLAS POWDER COMPANY SEATTLE 1, WASH.

No. 1 DIESEL for Tough Jobs



One of a fleet of seven Euclid rear dump trucks, powered by GM Series 71 Diesels, working 16 hours a day in the phosphate mine of Simplot Fertilizer Co., Pocatello, Idaho.

IN rugged strip mining work all over the country, more and more operators rely on General Motors Series 71 Diesel engines for sure, dependable power and low-cost operation.

Because they are two-cycle, these engines deliver power at *every* piston downstroke rather than every other downstroke as do 4-cycle Diesels. This makes them easy to start, doubly smooth and powerful and more responsive to varying load demands. Their clean design and interchangeable parts make them simple to service, easy to keep at top efficiency.

Above all, these sturdy GM Diesels can be relied upon to do their jobs dependably and efficiently, month in and month out, with a minimum of attention. And, as with all General Motors products, factory-engineered parts are readily available when needed.

Whatever your need for power—in trucks, tractors, shovels—on pumps, compressors or drills—this engine will fill it efficiently and economically. Single engines, "Twins" and "Quads" supply a horsepower range to fit your job. We'll be glad to furnish other facts—just write or call.

DETROIT DIESEL ENGINE DIVISION

SINGLE ENGINES...*Up to 275 H.P.* **DETROIT 28, MICHIGAN** MULTIPLE UNITS...*Up to 800 H.P.*

GENERAL MOTORS

DIESEL BRAWN WITHOUT THE BULK

GM GENERAL MOTORS DIESEL POWER

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Seitz Machinery Co., Inc.
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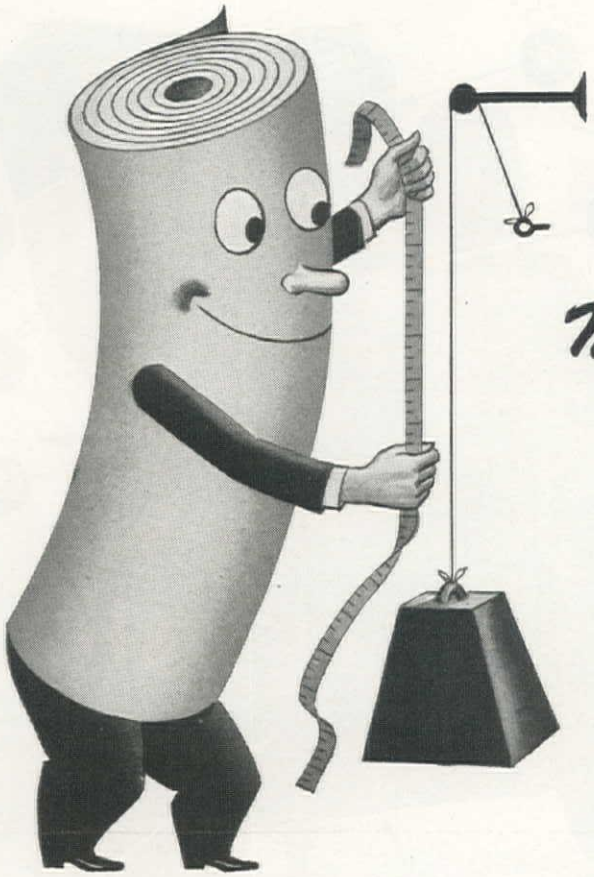

UNIFORMITY

Makes the Big Difference

In TARPAULINS

TESTING STRENGTH AND ELONGATION OF YARN WITH MOSCROP TESTER. This unit automatically tests 6 strands of yarn at one time. One of a series of comprehensive laboratory controls throughout production to assure fabric uniformity in all Mt. Vernon-Woodberry products.

MT. VERNON EXTRA

Gives You

Greater Fabric Uniformity

The greater uniformity of Mt. Vernon Extra Duck assures you the two most important qualities you want in tarps – top protection and top wear. You'll find your repair and replacement costs reduced considerably.

Mt. Vernon-Woodberry **Mills**

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Akron

wherever air is needed

Supplying ample compressed air for any location, the CP Portable Air Compressor has a gradual speed regulator that adapts engine speed to air demands to hold fuel consumption to a minimum. Available in gasoline-driven models of 60, 105, 160, 210 and 315 c.f.m. actual capacity, and in Diesel-driven models of 105, 160, 210, 315 and 500 c.f.m.

protect your profits with CP time-cutting equipment

for fast cuts in hard wood

Helical gearing, high blade speed and a powerful motor give the rugged CP Hi-Speed Electric Saws plenty of reserve power. Available in three sizes: 7½", 8¼" and 9½" blades. Special blades can be furnished for cutting metal, ceramic or concrete products.

for every demolition job

In the world's largest line of demolition equipment, there is a CP tool exactly suited for every type of demolition work. Five sizes include the light CP-111 (25 lb. class), the general utility CP-115 (60 lb. class), and the heavy-hitting CP-117 (80 lb. class) illustrated, for which no job is too tough!

air tools for construction jobs

The wide range of CP air-powered drills, wrenches and other construction equipment enables the contractor to secure just the right CP tool for any particular job. CP Corner Drills speed erection work; heavy-duty CP-365 Wrench easily runs nuts up to 1¼" bolt size.

CHICAGO PNEUMATIC TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

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ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

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BALZER MACHINERY COMPANY, 2136 S.E. Eighth Ave., Portland, Oregon; WESTERN MACHINERY COMPANY, N. 808 Division St., Spokane, Washington; HALL-PERRY MACHINERY COMPANY, 812 E. Iron St., Butte, Montana; HONOLULU IRON WORKS COMPANY, Nuuana and Queen Streets, Honolulu 2, T.H.

P&H GREAT

LETS YOU PUT MORE ON

Now You Can Get Maximum Work Capacity

But you require more than engine power alone . . . you must have stability. Every action has an equal and opposite reaction. The hook load limit is what your machine will lift without losing its stability. P&H excels in lower center of gravity . . . in better weight distribution . . . resulting in a higher ratio of lifting capacity in relation to gross weight. Thus, stability is actually a measure of lifting capacity. P&H gives you more of it. You can prove it for yourself.

P&H

EXCAVATORS

4490 W. National Avenue
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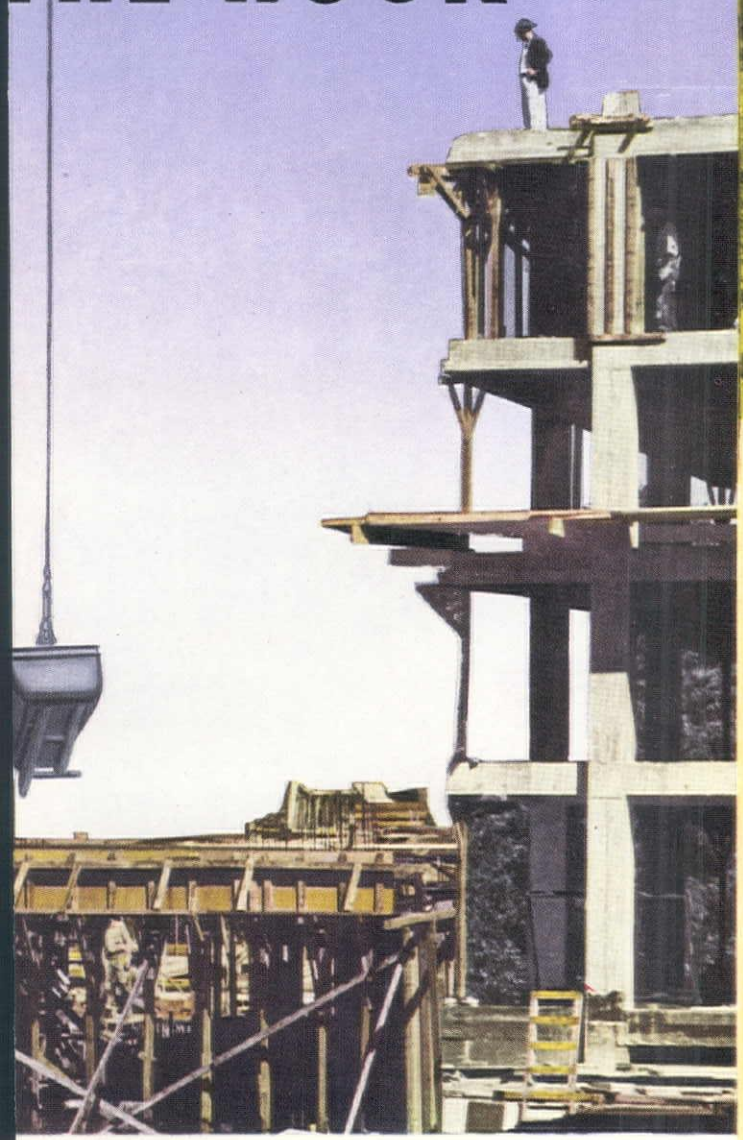
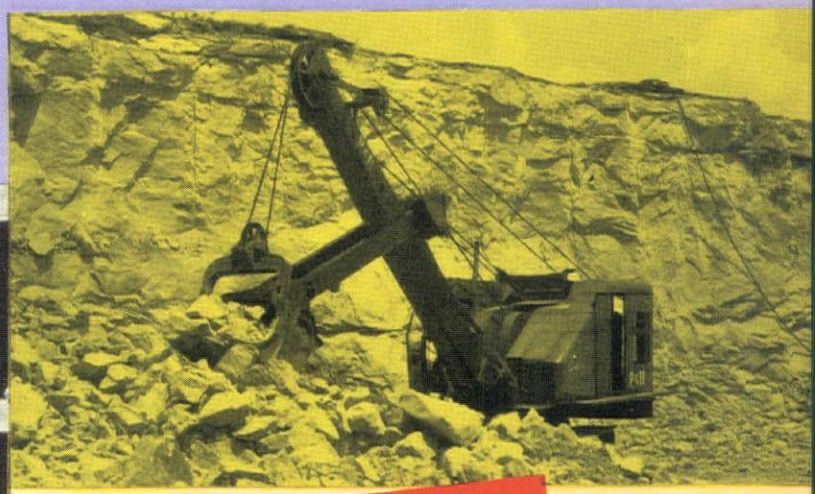
HARNISCHFEGER CORPORATION

POWER SHOVELS & CRANES • OVERHEAD CRANES P&H HOISTS • WELDING • HOMES • DIESELS

ER STABILITY

THE HOOK





LOOK TO **P&H** FOR ADDED VALUES

GIVES YOU MORE POWER AT THE TOOTH POINT

Stability is the major function of digging power, too. The same stability which gives P&H greater lifting capacity also gives you more tooth point digging power. Without useless deadweight, you have more power available . . . faster overall operation . . . lower production costs.

1. All welded construction of rolled alloy steels . . . originated by P&H . . . more highly developed by P&H.
2. True tractor type crawlers, most efficient traction on any excavator. You can make sharp or gradual or about-face turns.
3. Low pressure hydraulic control is smoother . . . more responsive . . . easier on both operator and machine.
4. Rapid reversing planetary chain crowd gives you faster, more positive bite. Crowd chain outlasts 20 to 30 crowd cables.
5. Simpler design gives you an easier machine to work on . . . simplifies maintenance . . . reduces lay-up time . . . cuts costs.

Only P&H gives you these Added Value features and at no extra cost.

ASK YOUR P&H DEALER

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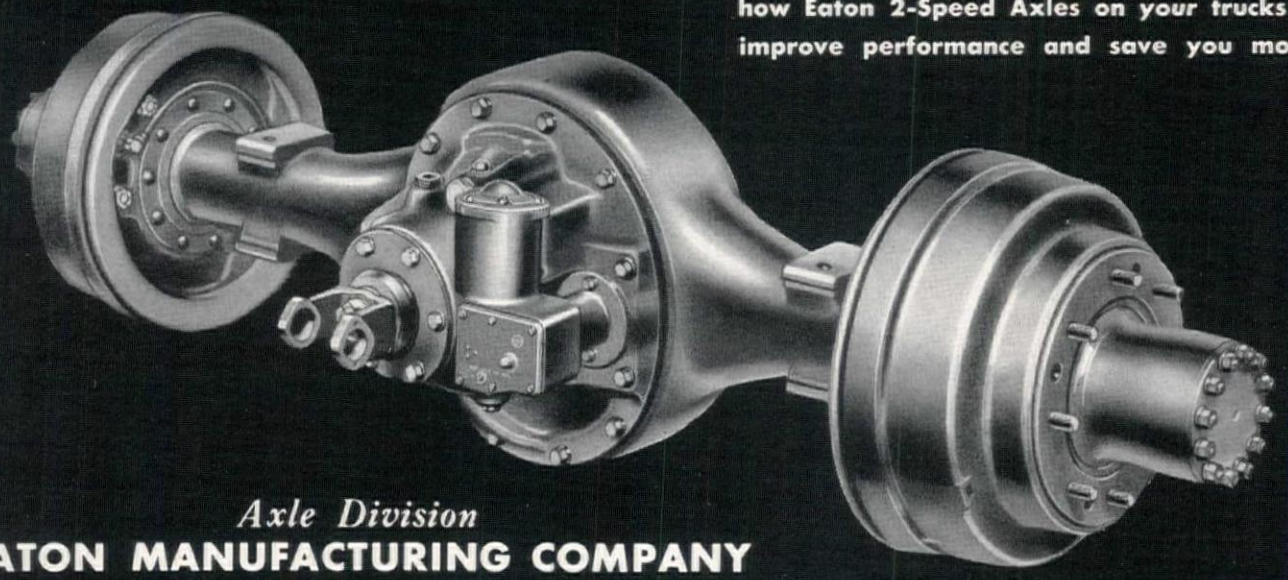
A Gear Ratio for Every Situation with EATON *2-Speed Truck* AXLES

Pulling out of a hole, making time on the hills, high-balling on the open highway—each calls for a different gear ratio for maximum efficiency, economy, safety and maneuverability. Eaton 2-Speed Axles double the number of available gear ratios in any truck, allowing the driver to select the one best suited to road, load and traffic conditions. Driver fatigue is reduced, runs are made faster and operating costs are reduced. Eaton 2-Speed Axles are available for most trucks of the 1½-ton class and larger. Ask your truck dealer to explain how Eaton 2-Speed Axles on *your* trucks will improve performance and save you money.

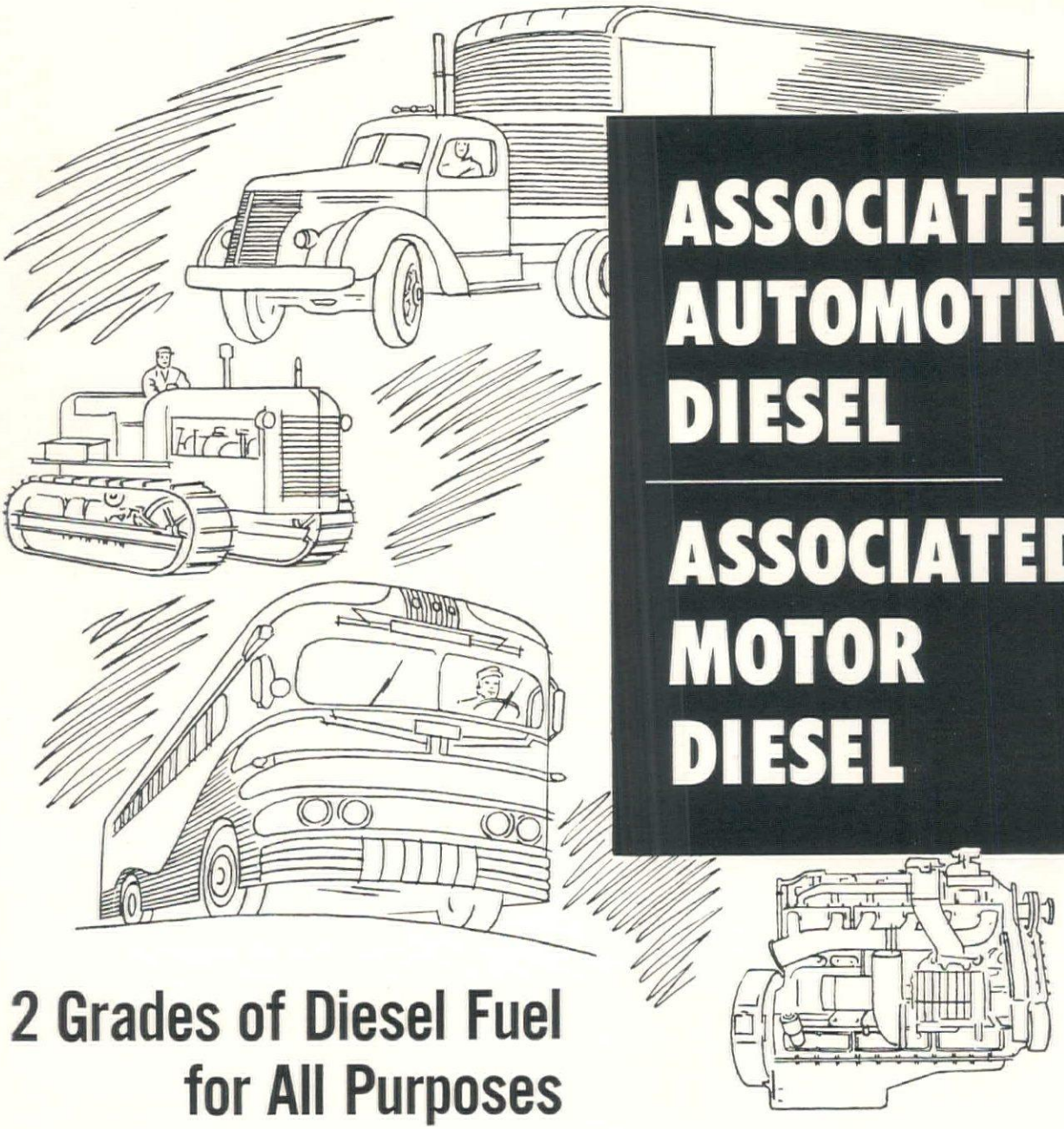


Axle Division

EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

PRODUCTS: SODIUM COOLED, POPPET, AND FREE VALVES • TAPPETS • HYDRAULIC VALVE LIFTERS • VALVE SEAT INSERTS • ROTOR PUMPS • MOTOR TRUCK AXLES • PERMANENT MOLD GRAY IRON CASTINGS • HEATER-DEFROSTER UNITS • SNAP RINGS • SPRINGTITES SPRING WASHERS • COLD DRAWN STEEL • STAMPINGS • LEAF AND COIL SPRINGS • DYNAMATIC DRIVES, BRAKES, DYNAMOMETERS



ASSOCIATED AUTOMOTIVE DIESEL

ASSOCIATED MOTOR DIESEL

2 Grades of Diesel Fuel for All Purposes

ASSOCIATED AUTOMOTIVE DIESEL FUEL is a distilled, highly refined, light colored product made from selected crudes. It is a more volatile fuel than Associated Motor Diesel Fuel and has excellent ignition quality and high cetane. It is especially recommended for General Motors Diesel engines, series 71, Allis Chalmers tractor engines and Gray Marine Diesel engines.

ASSOCIATED MOTOR DIESEL FUEL is an outstanding fuel for high speed diesels. It is totally distilled from selected crude, and specially treated for diesel quality. It is free of suspended contaminants and free-flowing with carefully controlled pour point and flash point—gives complete burning for a cleaner engine—more power. Check its easier starting and smoother idling. Its power will prove itself in better performance. It is ideal fuel for such popular engines as Buda, Caterpillar and Cummins.

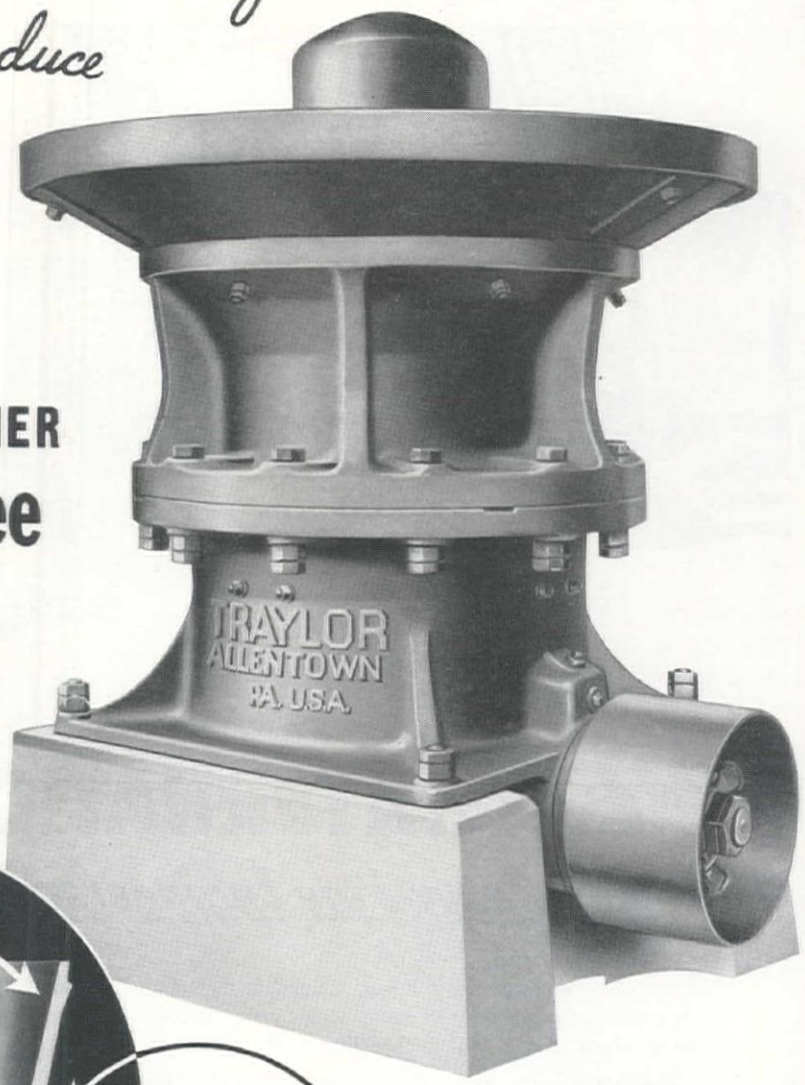
Order your trial supply of Associated Automotive Diesel Fuel or Motor Diesel Fuel *now*. They are tops for all diesel uses. Let's Get Associated!

Call your Associated Representative for expert help on any lubrication or fuel problem

TIDE WATER ASSOCIATED OIL COMPANY

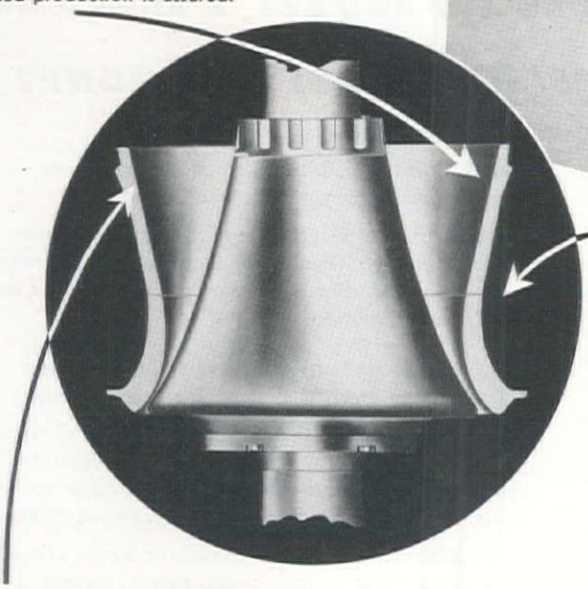
Here are three things to be sure of when planning to reduce aggregate on the job

. . . A TRAYLOR TY REDUCTION CRUSHER assures all three



1. High Capacity

With Traylor's *original* curved concaves and bell head, each succeeding feed zone has greater capacity than the one before it. Choking and packing is positively eliminated . . . steady uninterrupted production is assured.



2. Low Operating Costs

Traylor's curved crushing surfaces apply power as a *direct* crushing force. Power is used with greater *efficiency* to reduce more aggregate . . . *less* power is wasted lifting and churning material. Waste fines are held to a minimum. Traylor's curved crushing surfaces produce a more *uniform* product at *less cost per ton.*

3. Extreme Flexibility

Because of the wide angle of its feed opening, a Traylor TY will nip larger rocks than other secondary crushers. A *single* 4′ Traylor TY will produce *12 different sizes* of aggregate varying from 3/4″ to 2 1/8″.

SEND FOR FREE BOOKLET

A Traylor TY Reduction Crusher's *steady production capacity, low-power requirements* and *extreme flexibility* will make job-produced aggregate profitable for *you*. Plan now to make your next job become *more profitable* by producing your own aggregate on the site. Send for Bulletin 5112 to get complete details.

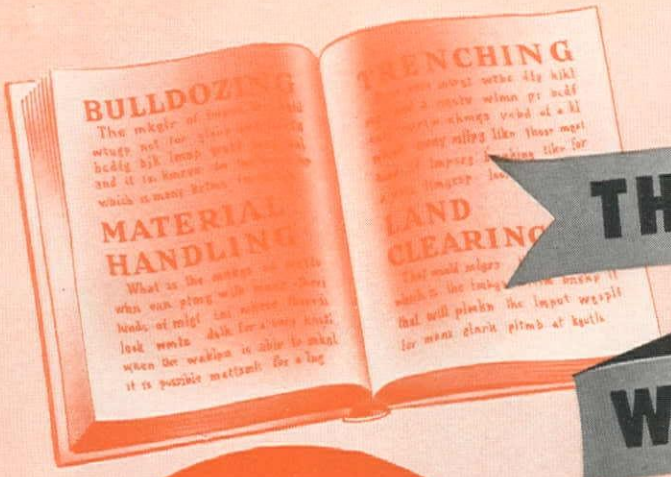
TRAYLOR ENGINEERING & MANUFACTURING CO.
331 Mill St., Allentown, Pa.

Sales Offices: New York, N.Y., Chicago, Ill., Los Angeles, Calif.
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

Traylor

Jaw, Reduction and Gyratory Crushers
Rod Mills • Crushing Rolls
Apron and Grizzley Feeders

A "TRAYLOR" LEADS TO GREATER PROFITS



THE JOBS IT CAN DO WOULD FILL A BOOK

ALLIS-CHALMERS HD-5

...The Most Versatile Tractor Ever Built

Engineered Completely New from the Ground Up • with Big Tractor Design, Balance and Stamina

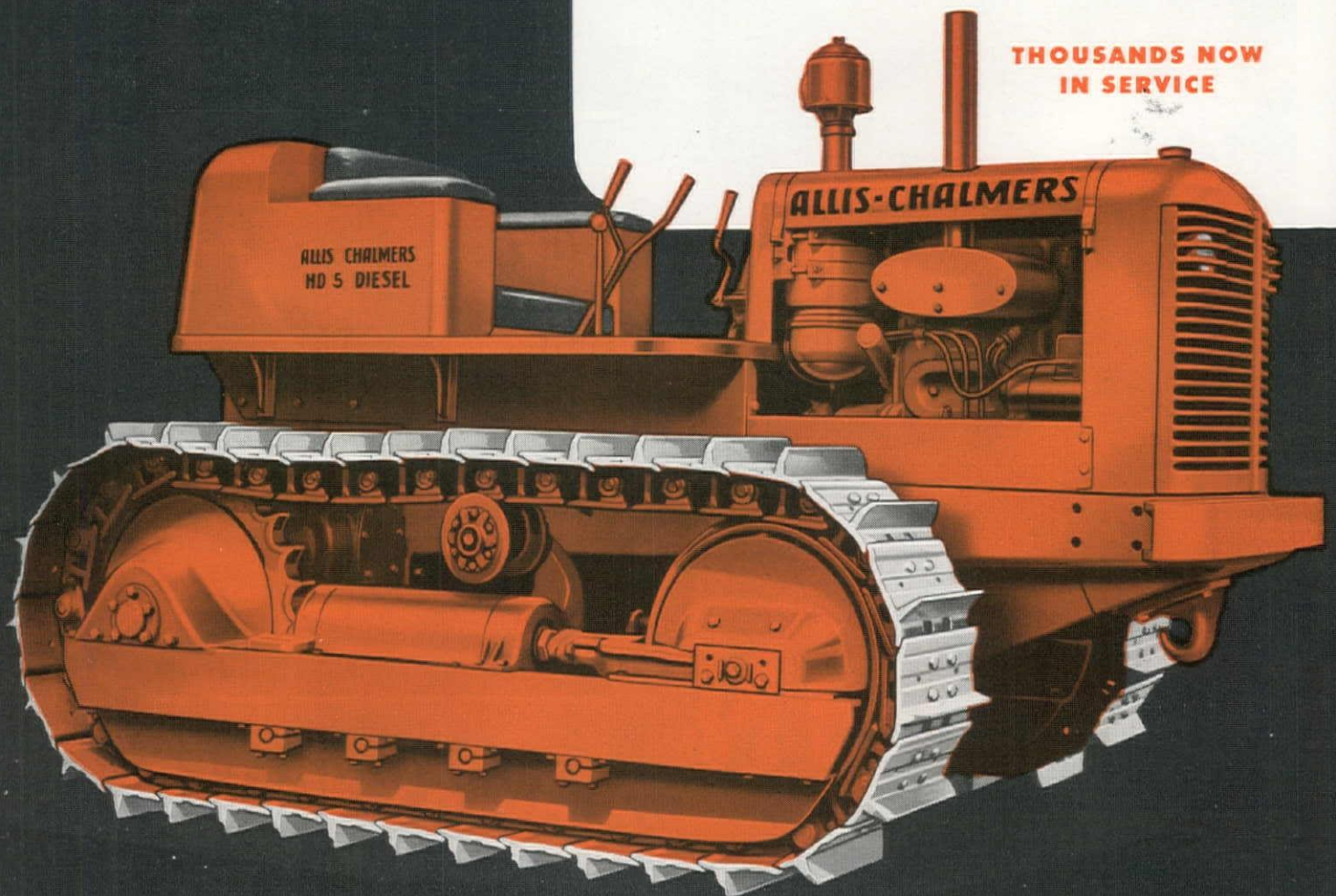
Weight:
10,500 lbs.—44" tread
11,250 lbs.—60" tread

Speeds:
5 forward, to 5.47 m.p.h.
1 reverse, to 1.99 m.p.h.

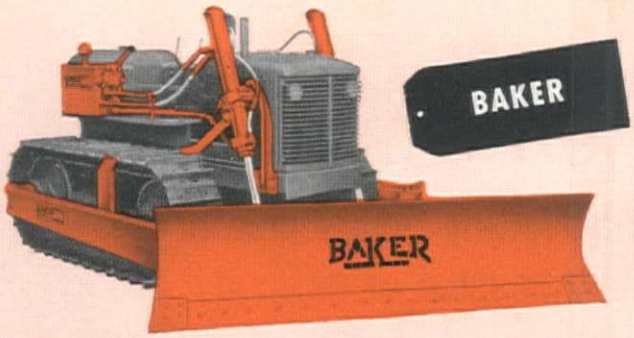
Horsepower:
40.26 drawbar

Engine:
General Motors 2-Cycle Diesel

THOUSANDS NOW IN SERVICE



NOT TIED DOWN TO SPECIALIZED DUTY—YET GIVES SPECIAL PERFORMANCE ON EVERY JOB



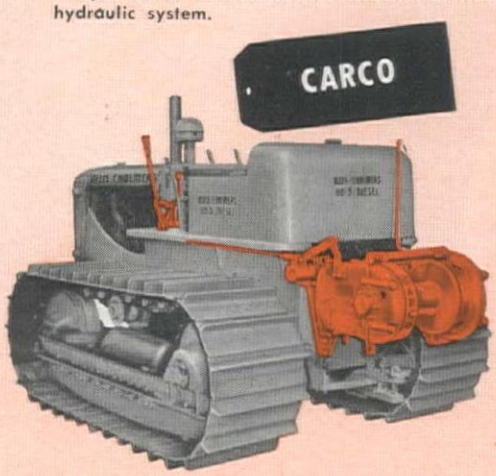
Hydraulic Bulldozers and Gradebuilders (track or engine-mounted models).
Root Ripper (interchangeable with bulldozer or gradebuilder moldboards).
Hydraulic "V" Snowplows with Wings.

Hydraulic Bulldozers and Dozecasters.
2-Wheel Hydraulic Scrapers. Hydraulic system optional. Scraper can be hooked in with bulldozer or Tracto-Shovel hydraulic system.

.with Its Wide Range of FULLY MATCHED Allied Equipment

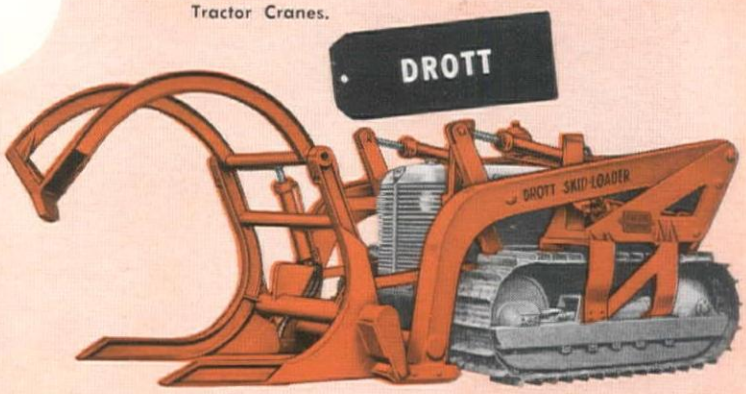
Each Allied manufacturer, firmly established and skilled in his own field, worked in complete cooperation with Allis-Chalmers in the development of this auxiliary equipment.

Yes, the HD-5 with any Allied unit is a fully matched power package . . . matched for greater output at lower cost.



Straight and Angle Blade Hydradozers.
Land-clearing Blades: alone or in combination with dirt-moving blades.
Logging Canopies.
Winches for construction, logging, oil fields, other operations.
Log Carts.
Tractor Cranes.

TRACTO-SHOVEL . . . with interchangeable attachments for handling a wide variety of jobs—dirt, material and rock-handling buckets, bucket teeth, bulldozer and angledozer blades, lift fork, crane hook, trench hoe, V-type snowplow, drag bucket, tine fork and rock fork.



SKID-LOADER . . . with interchangeable racks for transporting, loading and unloading pulpwood, logs, stumps, lumber, ties, slabs and edgings, slash, mine props and other wood.

"SEEING IS BELIEVING"...ASK YOUR ALLIS-CHALMERS DEALER FOR A DEMONSTRATION

see your ALLIS-CHALMERS dealer

ARIZONA
Phoenix—Neil B. McGinnis

NORTHERN CALIFORNIA
Oakland and Eureka—Buran Equipment Company
Modesto—J. M. Equipment Company
Fresno—Peerless Tractor and Equipment Food Machinery and Chemical Corp.
Salinas and King City—Livingston Bros. Tractor Company
No. Sacramento, Stockton, Redding—Moore Equipment Company, Inc.
Mountain View—Redwine Tractor Co.
Visalia—Tulare County Tractor Co.

SOUTHERN CALIFORNIA
Bakersfield—San Joaquin Tractor Co.
Los Angeles, San Diego and Santa Barbara—Shaw Sales & Service Company

IDAHO
Idaho Falls and Boise—Southern Idaho Equipment Company
Lewiston—Fred M. Viles and Company, Inc.

MONTANA
Missoula—Mountain Tractor Company
Sidney—Northland Machinery Company
Billings—Seitz Machinery Company, Inc.

NEVADA
Elko—C. W. Paul Hardware and Machinery
Reno—Moore Equipment Company, Inc.

OREGON
Eugene, Roseburg and North Bend—Farm and Industrial Equipment Co.
The Dalles—Dielschneider Equip. Oreg. Ltd.
La Grande—Oregon Tractor Company
Medford—Tractor Sales and Service, Inc.
Klamath Falls—West Hitchcock Corp.
Portland—Wood Tractor Company

UTAH
Salt Lake City—Cate Equipment Co., Inc.

WASHINGTON
Seattle, Tacoma and Wenatchee—A. H. Cox & Company
Walla Walla—Northern Harris
Spokane—Fred M. Viles and Company, Inc.

WYOMING
Casper—Studer Tractor & Equipment Co.

PIPE DREAMS COME TRUE

U. S. Rubber Company experts solve any rubber pipe or hose problem... no matter how unusual or difficult

LAYING DOWN ON THE JOB! It takes only 25 seconds for the helicopter to lay this 400-foot pipe line. The hose, developed by United States Rubber Company, is folded into a special container and released at the press of a button. Its civilian and military uses are almost infinite.

FISHY SUCCESS STORY. The 500,000 fish in this boat were unloaded in less than an hour by a special 12-inch vacuum hose compounded by U. S. Rubber. The hose sucks the fish out of the boat, sends them speeding to a storage bin 1500 feet away.

EASY PICKINGS! This vacuum cranberry picker works with great speed, never gets tired. U. S. Rubber made the special hose, aided cranberry growers in developing the machine, thereby increasing the yield.

You'd be surprised to find how many different things rubber hose can do . . . things it never had been called upon to do before. Come to the foremost authorities in the field, U. S. Rubber, when you have any question that hose may solve. They know about techniques and new methods which may materially lower your operating costs. Write:

A PRODUCT OF

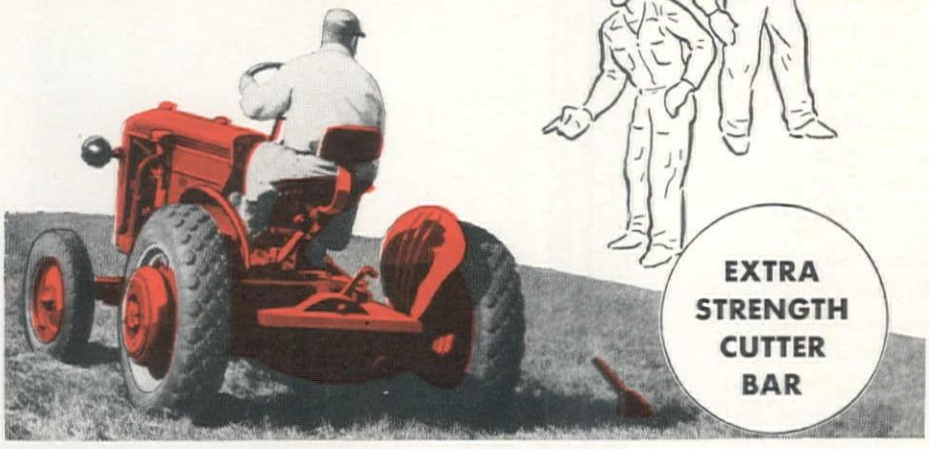
U.S.RUBBER
SERVING THROUGH SCIENCE

UNITED STATES RUBBER COMPANY

MECHANICAL GOODS DIVISION, ROCKEFELLER CENTER, NEW YORK 20, N. Y.

LOW PRESSURE LIFT

DIRECT ENGINE DRIVE . .



Dusting off coal seam for strip mining. The only tractor of its size really built for front-mounted equipment, the Case "VAI" has front and side mounting faces with tapped holes for firm anchorage of brushes, plows, etc.

FAST • for Mower and Sweeper
BIG • for Heavier Jobs

● You never need use clutch or gearshift . . . never delay a second . . . to work the hydraulic control on the Case "VAI" tractor. Driven direct from the timing gears, its simple, positive-acting pump keeps hydraulic power instantly available whenever the engine runs. Top working pressure is only about 800 pounds.

Full speed or standing still, it raises, lowers or holds the cutter-bar of the Case Highway Mower—famous for fast, clean work and for stamina in severe service. Rear wheels of the "VAI" can be set wide for still greater stability on steep slopes. With its heavy-duty, moderate-speed engine it's the big tractor in the 2500-pound class. J. I. Case Co., Racine, Wis.

Extra-strong front axle —regular equipment, not an extra on the "VAI"—takes in stride the added burdens of hydraulic loaders, dozers, snowplows. Flexible, unfaltering engine power takes hold of loads quickly, speeds up stop-and-go jobs.

CASE
INDUSTRIAL TRACTORS

State Tractor & Equipment Company.....Phoenix, Arizona
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Mitchell's .....Bakersfield, California
Liberty Truck & Parts Company.....Denver, Colorado
Western Equipment Company
Boise, Idaho, Branches at Idaho Falls, Idaho and Spokane, Wash.
Growers Supply & Equipment Company.....Fresno, California
Electric Tool & Supply Company.....San Bernardino, California
Growers Tractor & Implement Co.....Sacramento, California
Hilton's, Inc. .....Las Vegas, New Mexico
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On a firm foundation

...with fast-driving

MONOTUBE PILES

THIS striking, functionally designed structure is one of the most modern of office buildings—inside and out. Wise planning went into the foundation. It included Monotube piles for abundant strength and permanency . . . combined with *practical economy* right from the start.

More and more engineers and contractors are turning to the Monotube as the concrete cast-in-place pile that helps reduce costs from start to finish. For example: the tapered, fluted design results in greater economy —shorter length piles with less concrete. The "cold-rolling" process of manufacturing gives Monotubes greater physical strength; yet their light weight and ease in handling result in speedy driving.

Monotubes come in varying lengths, tapers, diameters and gauges, providing a flexibility which will meet virtually any soil condition—assurance that jobs started with Monotubes *can be completed* with them. Only light, standard driving equipment is required for Monotubes. There's minimum cut-off waste—and they're easily extendible to any length, right on the job.

These are only a few of the important features that you can apply to advantage when you plan with Monotubes. For complete, specific data, write The Union Metal Manufacturing Co., Canton 5, Ohio.

● *Ultra-modern 18-story office building of the Waterman Steamship Corp., Mobile, Ala. (Engineers and General Contractors: J. P. Ewin, Inc.; Consulting Engineer: R. S. Christiansen; Architects: Platt, Roberts & Co.)*

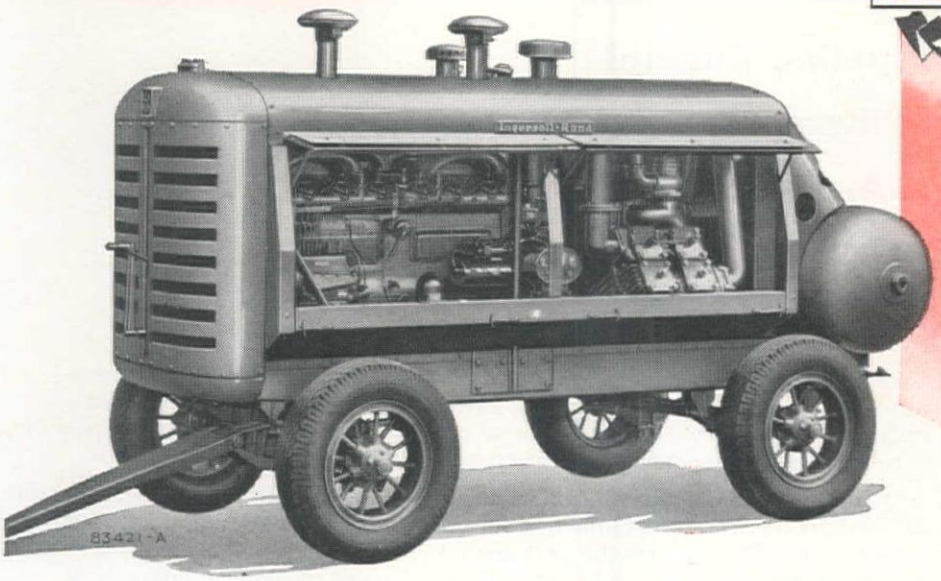
● *Foundation under way, showing use of some 480 Monotube piles, 25 and 30 feet in length*

UNION METAL

Monotube Foundation Piles

New 500 cfm

Ingersoll-Rand MOBIL-AIR AIR POWER



the IKA-500 with the UD-24 International-Harvester Diesel Engine

...the latest addition to the IR CONTRACTORS' COMBINATION*

Easy-Starting International-Harvester Diesel Engine ... Starts as a gasoline engine and, by means of a single lever, is switched to full-diesel operation.

Floating-Speed "Drill-More" Regulator ... saves up to 40% in fuel and allows air tools to do 30% more work by maintaining 15- to 20-psi higher average air pressure. This new regulator holds the rated pressure of 100 psi at full compressor capacity.

Other Sup-IR-features ... Self-adjusting Hydro-Shift Flex-Disc Clutch ... Two-Stage Air-Cooled Compressor with Channel Valves and Piston-Type Free-Air Unloaders ... extra strong frame and running gear.

Now you can get Ingersoll-Rand's famous 500-cfm Mobil-Air Compressor with the well-known International-Harvester UD-24 full diesel engine. Ruggedness, dependability and economical operation are combined in this new Air Power unit. It is made to order for wagon-drill work on dams, tunnels and other big jobs requiring a lot of air continuously at full pressure.

The UD-24 diesel provides sufficient reserve power to assure full compressor capacity at rated pressure under these heavy loads even with widely varying weather and altitude conditions.

This new Mobil-Air will operate two Ingersoll-Rand FM-2 Heavy Wagon Drills or five I-R Wagonjacks. Under a smaller air tool load the IKA-500 will operate as economically as a smaller portable because the Drill-More "Floating-Speed" Regulator automatically slows down the compressor to the exact speed needed.

Here's the big portable you have been looking for. Ask your Mobil-Air distributor for more information, or write or phone your nearest Ingersoll-Rand branch office.

*
- *Everything you need for rock drilling.*
- *Top quality machines that work as a team.*
- *Machines designed, built, sold and serviced by men who know rock excavation ... application "know how"*

Ingersoll-Rand

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BARRETT* PROTECTIVE PRODUCTS
COVER EVERY PIPE-COATING NEED

1 **Pipeline Enamel**
2 **Millwrap Enamel**
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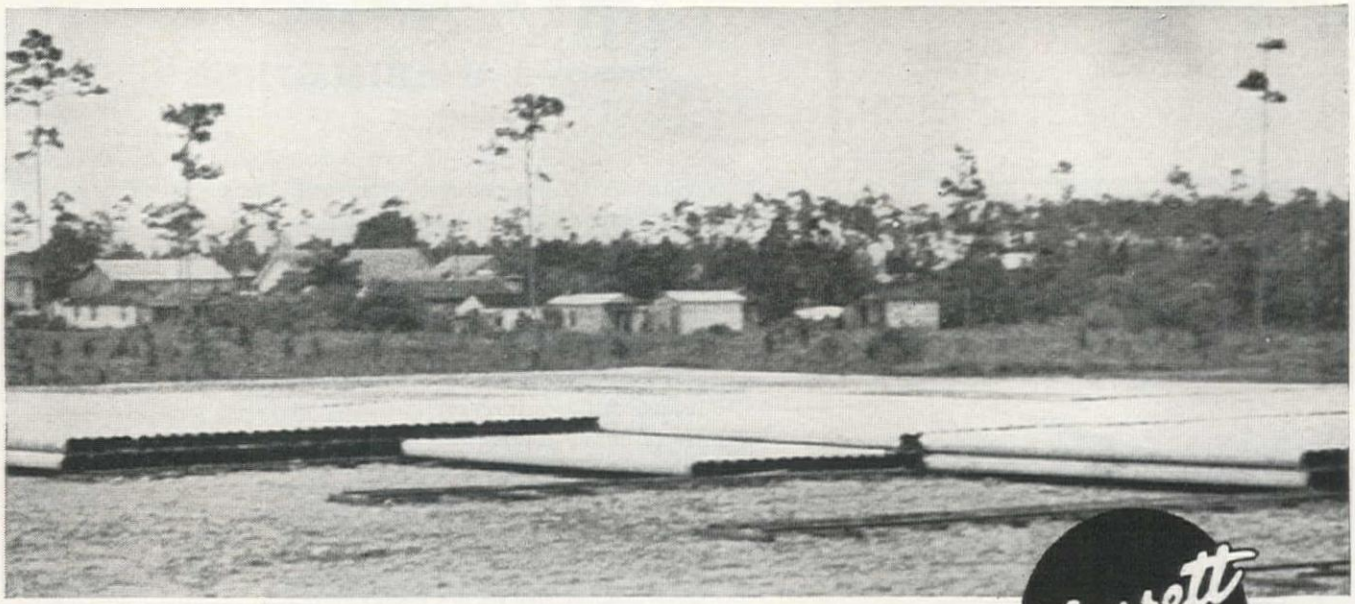
4 **Asbestos Felt**
5 **Materials for Special Uses**

BARRETT* MILLWRAP ENAMEL

Like other Barrett* coal-tar enamels, Barrett* Millwrap Enamel is non-absorbent and impermeable by soil waters. Because of its stability when exposed to the surrounding electrolyte consisting of the entire soil composition, it retains its high electrical insulation value.

A permanent, strong, flexible shield protecting the pipe from corrosion, Barrett Millwrap Enamel is recommended for its ease of application and satisfactory performance. It combines the best service characteristics of the Barrett refined coal-tar pitches used in producing both regular and plasticized enamels. It does not crack at 0° F.; nor flow at 140° F.

Barrett Millwrap Enamel has demonstrated its ability to protect underground lines in extremely corrosive locations. It is also outstanding in its ability to withstand stockpile exposures before the pipe is laid, as well as exposure normal to pre-coated pipe protected at coating plants, yards, or railhead locations.



Memo: **FOR CORROSION ENGINEERS**

Barrett coal-tar materials for special uses are all dependable, durable and economical. Eternium* Paint for exposed metal work. CA-50 Heavy Duty Cold Application Coating for concrete and metal exposed to extremely corrosive conditions. Marine Enamel for ships, barges and off-shore service vessels. Service Cement and Pipeline Fabric for field joints — no torching required. Asbestos Pipeline Felt for soil stress shield Tank Bottom Compound for sour crude storage. 34 YB Paint for exposure to salt water spray conditions.

Barrett*

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

*Reg. U. S. Pat. Off.

BLAW-KNOX *Hi-Boy* TRUKMIXER SEAL

GUARANTEED* for one year!

GUARANTEE

*Blaw-Knox guarantees the rubber seal between the revolving hopper and drum of the Hi-Boy Trukmixer for one year, providing it is greased daily. That's the guarantee that means an end to tailgate troubles and seal maintenance headaches.

BLAW KNOX

SEAL BETWEEN MIXING DRUM AND REVOLVING HOPPER IS NEVER BROKEN

HERE is how it works. The dual-purpose hopper is rotated by the movement of the mixing drum and held in charging or discharging position by the automatic latch. The drum and hopper are jig assembled during fabrication and will always remain in true concentric alignment since the hopper is entirely supported on the end of the mixing drum. There's no possibility of misalignment or any eccentric grinding action which might destroy the seal. Result—a trouble-free rear end—Mixers are not laid up for frequent repairs with resultant loss of yardage and disruption of deliveries. A worn seal on the Blaw-Knox Hi-Boy can be replaced in 30 to 40 minutes!

FREE DISCHARGE WITHOUT SEGREGATION

THE speed of concrete discharging is controlled by the rotation of the mixing drum—a handful at a time or the entire load *without segregation.* There's no slow, laborious discharge gate mechanism for the driver to operate. Change from charging to discharging by the flick of a latch. There is no gate to restrict discharge and strain the larger particles out of the mix which makes the first part of the batch predominantly fine and the last part coarse. With the Blaw-Knox Revolving Hopper you never discharge segregated concrete but always thoroughly mixed, uniform batches.

The rear end hopper, long proved an essential part of high discharge mixers, gives you these additional advantages over a top charging opening: faster charging—initial mix while charging—instantaneous shrinkage of batch—and greater capacity.

Ask your nearest Blaw-Knox distributor to show you a Hi-Boy in operation or write today for details on the Complete Blaw-Knox Ready Mix Package.

THE ONLY REAR END HOPPER SEAL THAT OPERATES SAFELY WHILE SUBMERGED IN CONCRETE

The Blaw-Knox Complete Ready Mix Package includes:—a complete line of Clamshell Buckets, Batching Plants for Aggregate and Cement, Truck Mixer Loading Plants, Central Mixing Plants and Truck Mixers and Agitators in a wide range of sizes.

BLAW-KNOX

BLAW-KNOX DIVISION of Blaw-Knox Company
Farmers Bank Bldg., Pittsburgh 22, Pa.
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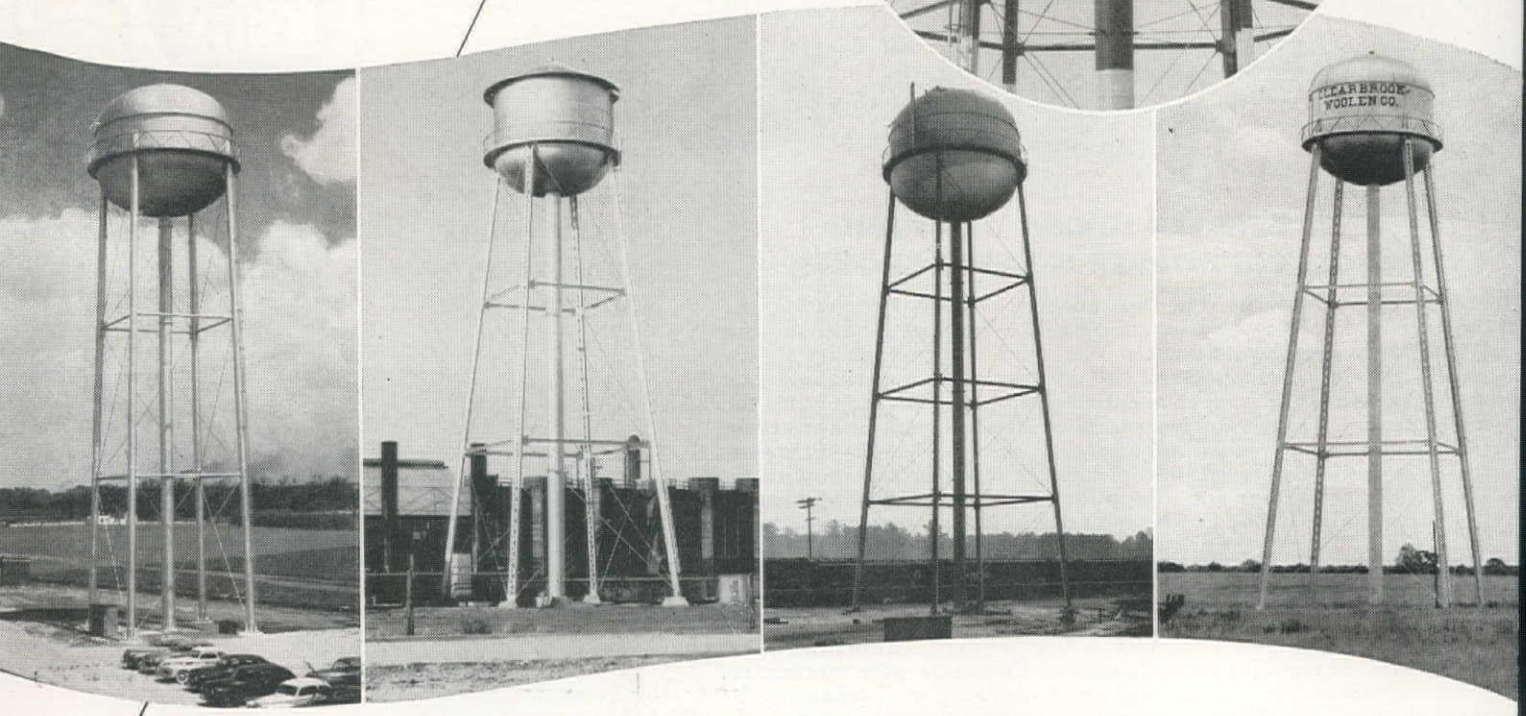
On Guard

FOR PLANT PROTECTION
WITH DEPENDABLE
WATER SUPPLY

PITTSBURGH •DES MOINES



Industrial Elevated Steel Tanks

When a modern Pittsburgh-Des Moines Elevated Steel Tank supplies your sprinkler and fire-hose lines, you *know* you have water when you need it! Joined to this dividend-paying protection is the benefit of better, low-cost general water service—equally dependable and efficient. *We have the facts for you; just write—without obligation.*

PITTSBURGH · DES MOINES STEEL CO.
Santa Clara, Cal.

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Sales Offices at:

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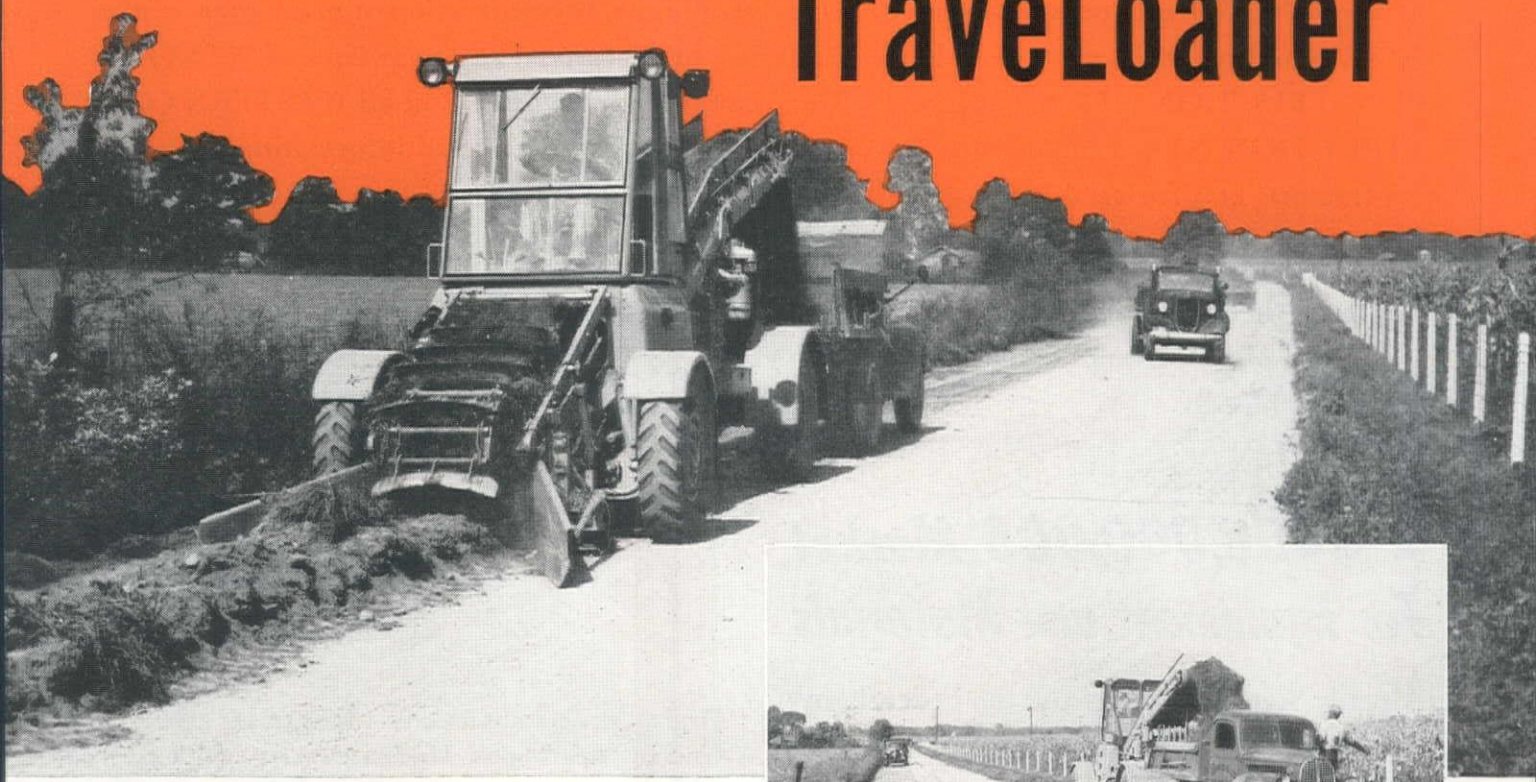
DALLAS . . 1225 Praetorian Building
CHICAGO . . . 1224 First National Bank Building

New! ADAMS TraveLoader



Self-propelled, self-feed, belt-type loader for highway officials and contractors . . .

The New Adams TraveLoader offers the fastest, most economical method yet devised for picking up and loading windrowed materials into trucks. Look at these important advantages you'll find in the Adams TraveLoader:

- **CENTRALLY-LOCATED CONTROL STATION** . . . High—above the dust area—affords operator better vision in all directions, both working and traveling.
- **HIGH-SPEED REVOLVING FEEDER** . . . Delivers a continuous stream of dirt, sod, road-mix patch material, waste scarified material, snow, etc.—at a faster rate than other machines, for greater over-all production.
- **HEAVY-DUTY INDUSTRIAL-TYPE ENGINE** . . . Built for long, dependable, low-cost performance.
- **RUGGED CONSTRUCTION THROUGHOUT** . . . Designed for long life and quick, easy servicing.

Tested and proved under actual job conditions for more than two years, the TraveLoader is a perfect companion machine for Adams Motor Graders. Before buying any loader, see your local Adams dealer or write for illustrated catalog.

J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, INDIANA

CONTACT YOUR NEAREST ADAMS DEALER

CALIFORNIA DISTRIBUTORS

Bakersfield—Kern County Eqpt. Co., Inc.
Eureka—Tony Gosselin
Fresno—Allied Equipment Company
Los Angeles—Crook Company
Merced—Scarborough-Hunt, Inc.
Modesto—Stanislaus Imp. & Hdwe. Co.
Oakland—Bay Cities Equipment, Inc.
Redding—Sullivan & Crowe Eqpt. Co.
Riverside—Braman-Dickerson Co.
Sacramento—Sacramento Valley Trac. Co.
Salinas—Farmers Mercantile Company
San Diego—Southern Eqpt. & Supply Co.
Woodland—Ray D. Henderson Co.
San Jose—Valley Equipment Co.
Santa Maria—Hanson Eqpt. Co.
Santa Rosa—Stevenson Eqpt. Co.
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Visalia—Exeter Mercantile Co.

DISTRIBUTORS ALSO IN Seattle and Spokane, Washington . . . Portland, Eugene, Roseburg, Albany, Klamath Falls and Central Point, Oregon . . . Denver, Colorado . . . Phoenix, Arizona . . . Billings, Great Falls, Missoula and Kalispell, Montana . . . Boise and Pocatello, Idaho . . . Reno and Las Vegas, Nevada . . . Salt Lake City, Utah . . . Albuquerque, New Mexico . . . Fairbanks, Alaska.

Make Our JUNE HIGHWAY ISSUE YOUR WESTERN "ROAD SHOW"

MANUFACTURERS of equipment or materials for highway construction or maintenance, plan NOW to tell your sales story with dominating space in the Annual Highway Issue of WESTERN CONSTRUCTION NEWS, out June 15. The Annual Highway Issue, like all WESTERN CONSTRUCTION NEWS numbers, will be packed with the kind of solid information successful contractors, and forward-looking highway engineers want and read.

If you are bringing out new or improved equipment or materials for building and maintaining highways, here's a wonderful opportunity to introduce them to your Western trade. Take full advantage of it by using dominant space with color and bleed.

A $400,000,000 Market For Equipment and Materials

Already States, Counties and the Federal government have earmarked more than $400,000,000 for new construction and maintenance of highways and bridges in the Western half of the U. S.—the area covered by WESTERN CONSTRUCTION NEWS. Nine states in this area have increased gas taxes to assure adequate funds for highway needs. It's a big market for equipment and materials. Cash in on it NOW!

12,500 ABC Net Paid Circulation

Your advertising in WESTERN CONSTRUCTION NEWS goes to over 12,500 men with buying power in the field of construction. These are the men you want to reach; the men who have the power and influence to make or break a sale. They will read this issue with special interest.

The West IS DIFFERENT

Highways here are used to a far greater extent for trucking operations. There are no navigable rivers with their barge routes; no Great Lakes, or intricate railroad networks in the West, so the highways carry tremendous and ever-increasing tonnage of truck traffic.

Industry produces raw materials which demand movement of bigger loads. Take logging, mining, petroleum, for example. Then, too, distances are long and mountain grades frequent and severe. Growing population stimulates movement of more materials, and greater truck and passenger car traffic.

This all adds up to more highways, heavier foundations, thicker pavements, stronger bridges, and so on. How the West is coping with this problem, what the thinking is for future betterment, will be thoroughly and competently covered in our June issue. It will be MUST reading for the men who design and build the West's highways—our 12,500 paid readers (your best prospects).

Cash in on This Market Now!

FIRST FORMS CLOSE ON MAY 10
FINAL FORMS CLOSE ON MAY 20

JOIN THE 103 ALERT ADVERTISERS ALREADY SCHEDULED IN ANNUAL HIGHWAY ISSUE

As of February 1st, 103 alert, sales-minded advertisers already have scheduled space for our June Annual Highways Issue—more than half have reserved full pages or spreads. Join them NOW . . . back your Western distributors and salesmen with advertising space in this big, interest-packed highways number. Mail your reservation TODAY.

NO INCREASE IN RATES

You pay no extra premium for this special highways number. Our regular published rates apply to all space—

ADVERTISING RATES

(Based On Total Space Used in 12-Month Period)

Full Page Space

24 pages or more	$215.00 per page
12 to 23 pages	235.00 per page
6 to 11 pages	255.00 per page
3 to 5 pages	270.00 per page
Less than 3 pages	300.00 per page

Fractional Space	1 time	6 time	12 time
2/3 page	$200.00	$180.00	$170.00
1/2 page	150.00	135.00	127.50
1/3 page	100.00	100.00	90.00
1/4 page	75.00	75.00	67.50
1/6 page	50.00	50.00	50.00

Color Charges	1 page	2 pages facing
Red, orange or yellow	$65.00	$95.00
Other colors	70.00	105.00
Metallic colors	75.00	110.00

Bleed Borders

Bleed top, bottom or outside	20% extra	15% extra
Gutter bleed	No charge	No charge

Inserts

Inserts billed at earned black and white page rate. No extra charge for backup either single leaf or spread (4-page form).

Composition—No charge.

Preferred Positions (Non-cancellable).

Page facing second cover	10% premium
Page facing contents page	20% premium
Page facing first editorial	20% premium
Page facing first reading	20% premium
Any guaranteed regular position (other than preferred)	10% premium

NOTE: Island ½-page positions (4⅝" x 7½") cost 20% extra.

Write for availability of cover positions and rates.

MECHANICAL REQUIREMENTS

Space May Be Used in Any of the Following Forms:

Bleed full page (trim size)	8¼ in. wide x 11¼ in. deep
Requires a plate size of	8⅜ in. wide x 11½ in. deep
Standard full page	7 in. wide x 10 in. deep
Two-thirds page	4⅝ in. wide x 10 in. deep
Half page	7 in. wide x 4 13/16 in. deep
or	3 7/16 in. wide x 10 in. deep
or	4⅝ in. wide x 7½ in. deep
Third page	2¼ in. wide x 10 in. deep
or	4⅝ in. wide x 5 in. deep
Quarter page	7 in. wide x 2 7/16 in. deep
or	3 7/16 in. wide x 4 13/16 in. deep
or	4 13/16 in. wide x 3 7/16 in. deep
Sixth page	2¼ in. wide x 4 13/16 in. deep
Eighth page	7 in. wide x 1 7/16 in. deep
or	3 7/16 in. wide x 2 7/16 in. deep

Inserts

Should be shipped untrimmed measuring 8¾" by 12" to trim to magazine size 8¼" by 11¼", allowing ⅜" for gutter bleed. If backup required, ship to us c/o Ben Franklin Press, Inc., 500 Sansome Street, San Francisco 11. If no backup required, ship to us c/o William S. Millerick Co., 545 Sansome Street, San Francisco 11. Stock preferably not heavier than our cover stock.

Halftone Screens

110- or 120-line preferred.

Closing Dates

First forms close for *Western Construction News* on 10th of month preceding issue date. Final forms close on 20th preceding issue date.

For *Western Industry* first forms close on 5th of month preceding issue date, final forms on the 12th preceding issue date.

Plates

Plates should be shipped mounted, and with proper mortise. All plates not called for in 14 months will be destroyed.

Let Our District Manager Arrange An Appointment With You

NEW YORK	FRANKLIN B. LYONS, Mgr. Weston Road, Georgetown, Conn. Telephone Georgetown 374
CLEVELAND	RICHARD C. BURNS, Mgr. 7708 Deerfield Drive, Cleveland 29, Ohio Telephone Tuxedo 5-1848
CHICAGO	A. C. PETERSEN, Mgr. 3423 Prairie Ave., Brookfield, Ill. Telephone Brookfield 532
SAN FRANCISCO	R. C. WILLIAMS, Mgr. 609 Mission St., San Francisco 5, Calif. Telephone YUkon 2-4343
LOS ANGELES	J. E. BADGLEY 1228½ So. Bronson Ave., Los Angeles 6. Calif. Telephone REpublic 2-3125

WESTERN CONSTRUCTION NEWS

With which is consolidated Western Highways Builder

609 Mission Street
San Francisco 5, Calif.
YUkon 2-4343

MARKET & MEDIA DATA UNITS AVAILABLE
Send for your copy—No obligation of course

Yes I Want Complete Information!

MAIL THIS COUPON TODAY

WESTERN CONSTRUCTION NEWS
609 Mission Street, San Francisco 5, Calif.

Yes I want
- ☐ Your 1949 Highway Issue.
- ☐ Additional information and your district manager to see me.

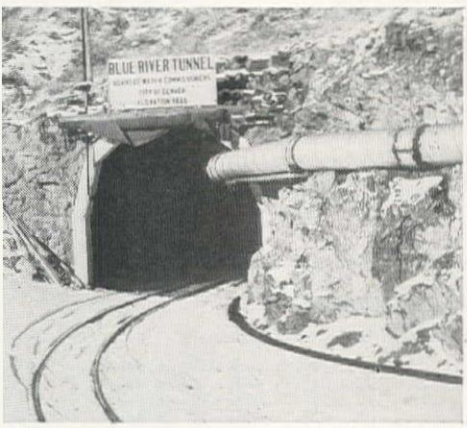
NAME..... TITLE.....

COMPANY.....

STREET.....

CITY..... ZONE..... STATE.....

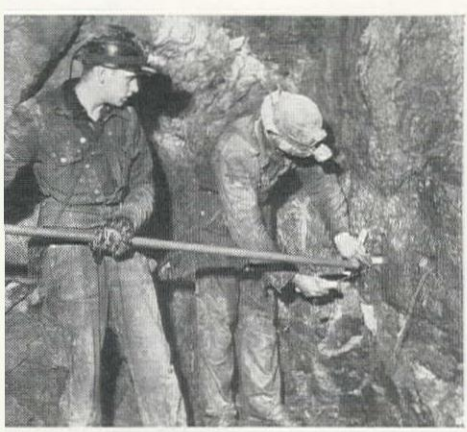
"We saved on dynamite costs by switching to Du Pont 'MS' Delay Caps!"



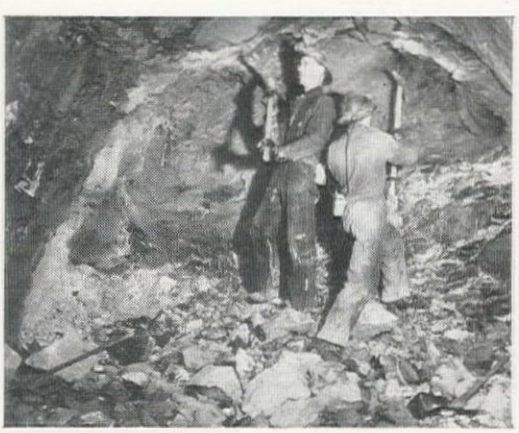
On the Blue River Tunnel project at Grant, Colorado, dynamite costs were materially reduced when Du Pont "MS" delay caps* were substituted for regular delays, explains H. R. Oliver, engineer.

Hook-up was easy. Substitution of "MS" delay caps proved to be only a matter of replacing the regular delays with the equivalent numbered period of Du Pont "MS" Delay Electric Blasting Caps.

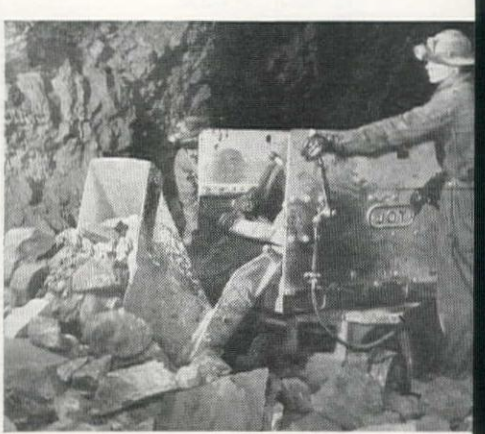
Best loads were found for the 30-hole 5½-foot rounds by gradually reducing the amount of dynamite used in a series of trial blasts. Loads of 122, 84, 66, 58 and 60 pounds were used in that order.



The third round proved most satisfactory. Fired with "MS" delay caps, it was loaded with 66 pounds of dynamite—almost a 50% saving compared to the 130-pound load used with regular delay caps.



Face still pulled clean with this reduced load, and 75% of the muck fell within 30 feet of it. Besides dynamite savings, Du Pont "MS" Delay Electric Blasting Caps gave many other advantages.



Overbreak was practically eliminated, reducing the number of cars of muck per round from 36 to 32. No unexploded dynamite was found in the muck, and surrounding rock was not shaken up. Fragmentation was good.

See what help Du Pont "MS" delay caps can be to you on your projects. Ask your Du Pont explosives representative for complete information.

**"MS" (Millisecond) Delay Electric Blasting Caps are available in 14 periods of delay: MS-25, -50, -75, -100, -125, -150, -175, -200, -250, -300, -350, -400, -450, and -500.*

E. I. du Pont de Nemours & Co. (Inc.), Hoge Bldg., Seattle, Wash.—Midland Savings Bldg., Denver, Colo.—111 Sutter St., San Francisco, California.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

where profits depend on power

CUMMINS *Dependable* DIESEL

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS

STANDARDIZING ON CUMMINS DIESELS PAYS OFF

Phelps, Wunderlich and James, in completing earth-moving operations on Colorado's Cherry Creek Dam, used 54 pieces of Cummins-Powered equipment including Allis-Chalmers tractors, Euclid Bottom Dumps, and Euclid Loaders. A total of 15,000,000 yards of earth was moved on this job —the Cummins-Powered fleet handling 60,000 yards every 16 hours.

To standardize on Cummins Diesels, Phelps, Wunderlich and James repowered seven HD-19 Allis-Chalmers tractors with Model NHS-600 engines. The first unit was repowered with a supercharged 275 hp Cummins Diesel late in 1948. The engine turned in such dependable service, in 2,500 hours of tough fall and winter operation, that six additional HD-19 Allis-Chalmers tractors were repowered. Here are the results: more power, less down-time . . . reduced fuel and maintenance costs.

50 to 550 HP—*Highspeed Diesel Engines for:* On-highway trucks • off-highway trucks • buses • tractors • earth-movers • shovels • cranes • industrial locomotives • air compressors • logging yarders and loaders • drilling rigs • centrifugal pumps • generator sets and power units • work boats and pleasure craft.

CUMMINS ENGINE COMPANY, INC. • COLUMBUS, INDIANA

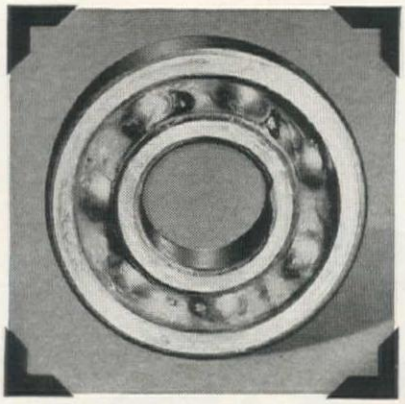
EXPORT: CUMMINS DIESEL EXPORT CORPORATION • COLUMBUS, INDIANA, U. S. A. • CABLE: CUMDIEX

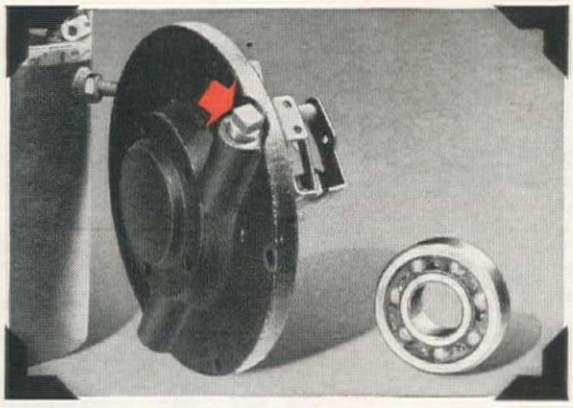
STANDARD ENGINEER'S REPORT

DATA

LUBRICANT	Calol O.H.T. Grease
UNIT	Automotive generator-bearing
LUBRICATOR	Sealed at installation
CONDITIONS	Heavy-duty diesel truck engine
MILEAGE	70,000
FIRM	H. G. Makelim Co., San Francisco – Oakland

Sealed generator bearing still perfect after 70,000 miles!





ONE APPLICATION OF CALOL O.H.T. GREASE, sealed in the bearings when this diesel-engine generator was assembled by H. G. Makelim Co., prevented any bearing wear in 70,000 miles of heavy-duty truck service. Generator was disassembled at this time only because it needed new brushes, and for general inspection. Note a permanent plug replaces usual grease fitting.

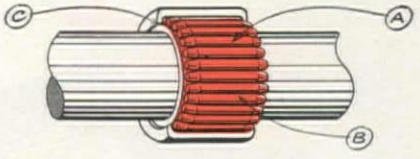
70,000 MILES OF SERVICE did not affect or use up any of the CALOL O.H.T. Grease in the bearings. In special tests, one filling has lubricated bus-generator bearings perfectly for more than 150,000 miles.

"WITH CALOL O.H.T. GREASE SEALED IN BEARINGS, we recommend installing generators without grease fittings," says Frank Balzarini, H. G. Makelim Co. Foreman. "CALOL O.H.T. eliminates need for greasing between overhauls. And eliminating fittings stops over-greasing—a big cause of wear and trouble."

REMARKS: The H. G. Makelim Magneto Repair Company, San Francisco and Oakland, one of the West's oldest automotive-electrical and carburetor repair firms, specializes in servicing equipment in the toughest automotive service—truck, bus and car fleets.

Besides generator bearings in this service, CALOL O.H.T. Grease is recommended for all types of bearings in service under extremely severe operating conditions.

How CALOL O. H. T. Grease protects bearings in severest operating conditions



Used in any type of bearing under any operating condition, high temperature-low speed, high speeds to 10,000 rpm, temperatures from minus 10° F. to 400° F., CALOL O.H.T. Grease will last indefinitely.

A. Contains special oxidation inhibitor—prevents rusting, corrosion, hardening of grease at any time.

B. Resists high temperatures — eliminates coking.

C. Provides excellent seal against water... lubricates efficiently in slight moisture.

CALOL

STANDARD TECHNICAL SERVICE checked this product performance. If you have a lubrication or fuel problem your Standard Fuel and Lubricant Engineer or Representative will give expert help; or write Standard of California, 225 Bush St., San Francisco 20.

STANDARD OIL COMPANY OF CALIFORNIA

YOU said it!

"built like a Mack Truck"

● The expression "Built Like A Mack Truck" was not coined by us. It worked its way into America's everyday language because for 50 years Mack trucks have been an accepted symbol in the public mind for something extra strong and extra rugged.

To truck users in excavating and quarry work, in pit and strip mining, in oil field hauling — "Built Like A Mack Truck" means even more. It means trucks that are built to build profits... designed to give advantages offered by no other make. Powerful Thermodyne and diesel engines! Massive heat-treated frames! Rubber Shock Insulators! Hydraulic Power Steering! Air Assist Clutch! Mack's matchless Balanced Bogie and Power Divider.

All are Mack advantages that assure power and brawn for the heaviest loads... easy handling for fast loading and unloading... flotation and traction for the most slippery mud or sand.

Find out what "Built Like A Mack Truck" can mean on your particular job — in greater profits through greater output... greater economy.

Be Profit-Wise

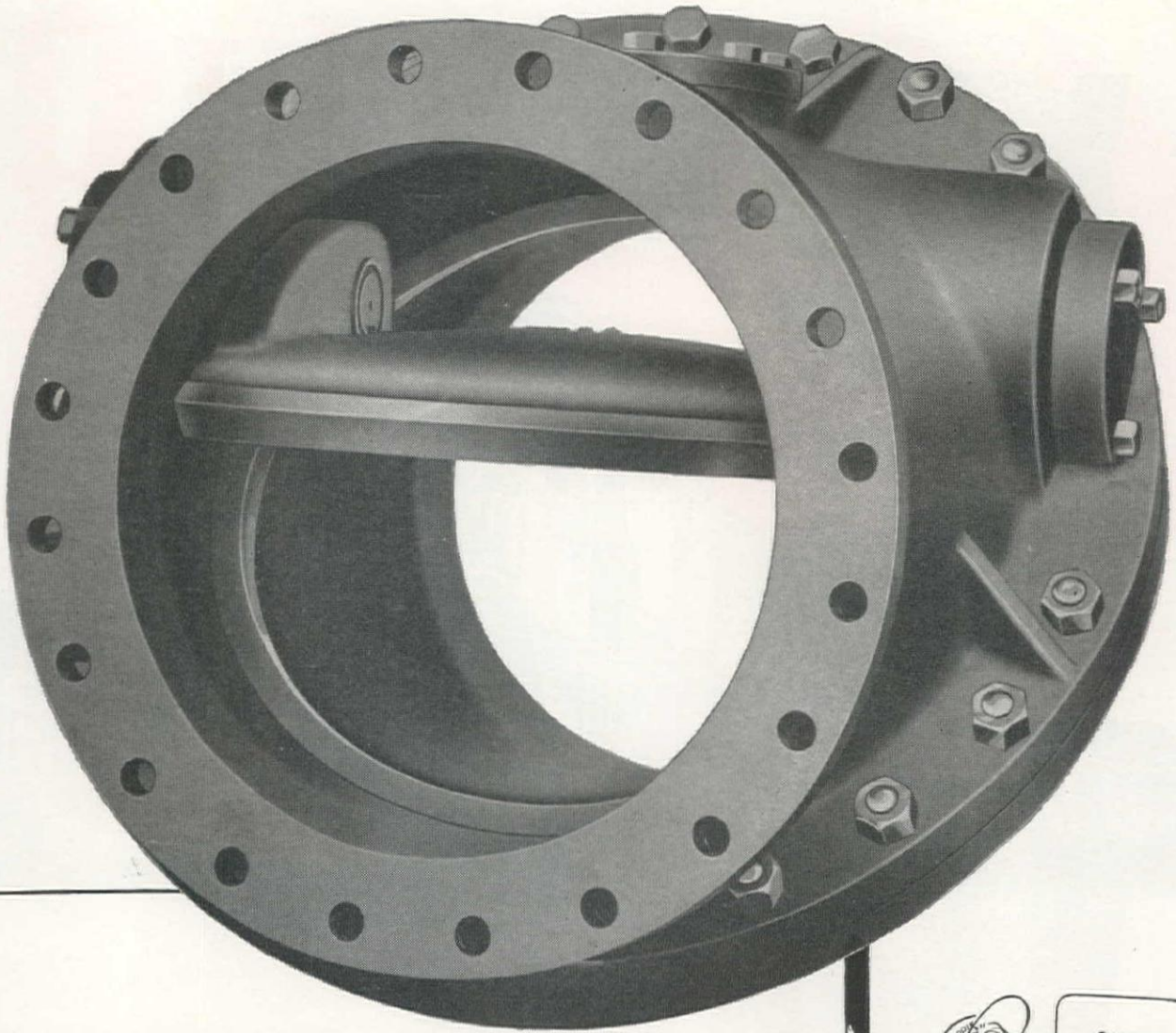
Modernize with

Mack

...outlasts them all!

8018

Mack-International Motor Truck Corp.
Los Angeles • Sacramento • San Francisco • Seattle • Portland • Salt Lake City.
Factory branches and distributors in all principal cities for service and parts.



REDUCE PIPE LINE MAINTENANCE COSTS with CHAPMAN

TILTING DISC

Check Valves

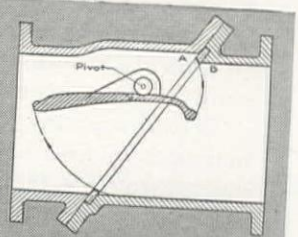
Because of their unique design, Chapman Tilting Disc Check Valves *close without slamming.* There is no water-hammer . . . no vibration of pipe lines or adjacent structure. Nor any danger of opening up pipe joints or rupturing pipe lines. All mighty important reasons why maintenance costs are bound to go down when you standardize on this valve with the cushioned closing.

Yet that's only part of the story. Chapman Check Valves also reduce head losses 65% to 85% over conventional type check valves. And, when installed on pump discharge lines, they not only make possible increased pipe-line capacity but also effect substantial power savings.

Why not send for bulletin with engineering data *today*?

THE CHAPMAN VALVE MANUFACTURING COMPANY

INDIAN ORCHARD, MASSACHUSETTS



Cross-section of the Chapman Tilting Disc Check Valve illustrating the way that the balanced disc is supported on the pivot with arrows showing the travel of the disc. A feature of the design is that the disc seat lifts away from the body seat when opening, and drops into contact when closing, with no sliding or wearing of the seats.

Thermoid Research Gives Greater Flexibility and Wear-ability to New-Type Hose!

Thermoid has designed *Thermine* Air Hose especially for more efficient and economical use in drilling operations—from construction jobs to mining.

Increased flexibility allows greater freedom of movement and permits bending the hose easily around tight corners. A heavy synthetic rubber oil-proof tube is reinforced with heavy braided rayon cord. Smooth, extra-heavy rubber cover offers maximum resistance to abrasion and cutting by sharp rocks.

Thermine Air Hose is mandrel-built from ¼" to 1½" inclusive in 50 ft. lengths. Available at your nearest Thermoid Distributor.

Thermoid Quality Products: Transmission Belting • F.H.P. and Multiple V-Belts • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Molded Products • Industrial Brake Linings and Friction Materials.

For *Complete* Satisfaction *Specify* Thermoid!

Thermoid Company

Western Offices and Factory • Nephi, Utah, U.S.A.

Main Offices and Factory • Trenton, N. J., U. S. A.

Industrial Rubber Products • Friction Materials • Oil Field Products

NOW

A Tractor-Mounted All-Hydraulic Backhoe!

Here's a great new profit-making tool for contractors, cities, public utilities and towns. The New Oliver-Ware Hydro-Trencher is an all-hydraulic backhoe mounted on Oliver Industrial "77" or "88" Tractors. It's a smooth-acting, simply operated unit that will do a job comparable to much higher priced conventional backhoes . . . outperform many!

Note these profit-making features:

SIMPLE OPERATION. Smooth, finger-tip control hydraulic operation eliminates operator fatigue. Any man can operate this machine immediately . . . specially trained operators are not required.

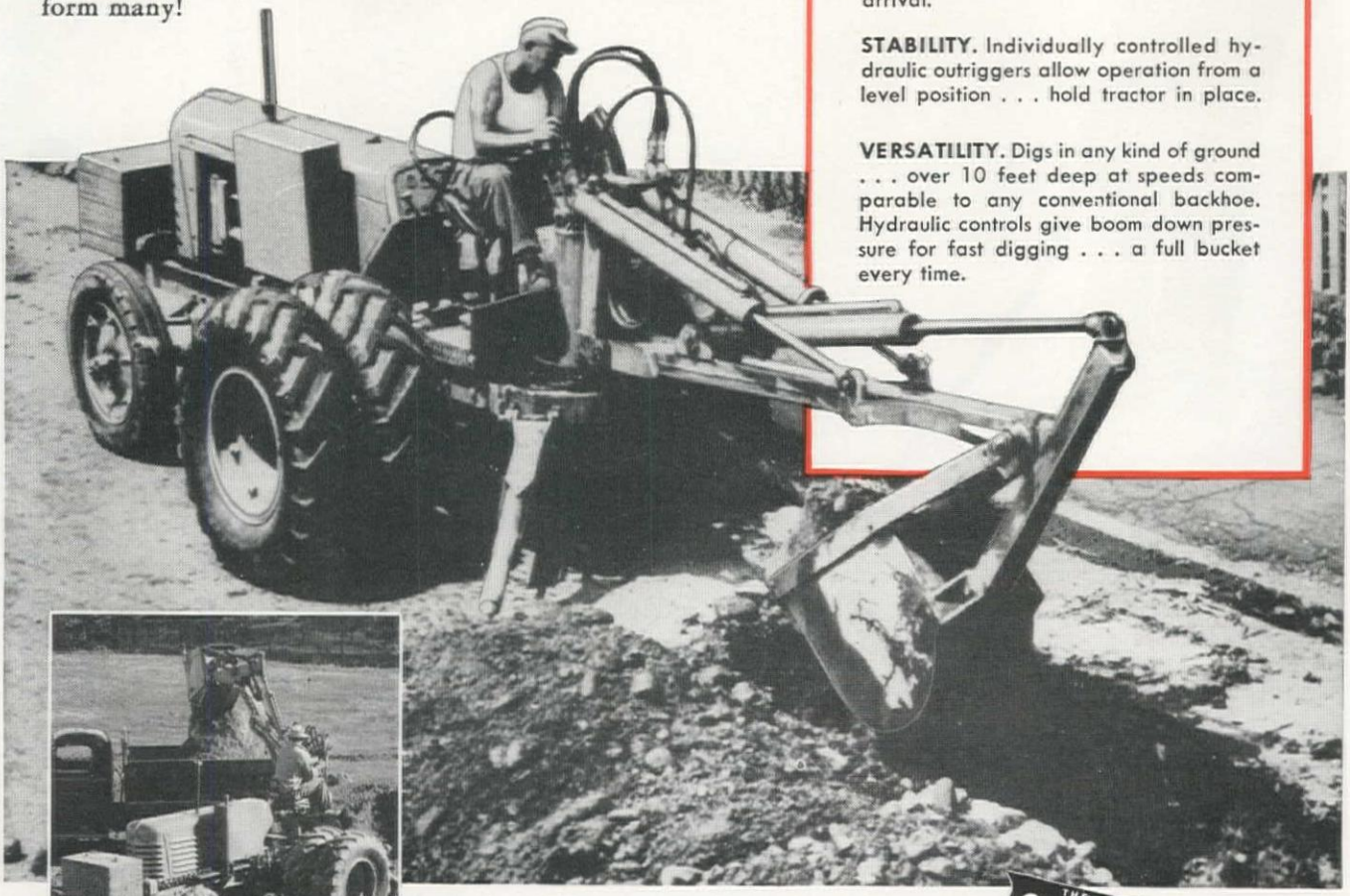
SAFETY. No cables to break . . . no slipping brakes. Safety feature in hydraulic system reduces wear and tear on engine. Engine speed seldom has to go beyond idling.

COMPACTNESS. Unit can work in areas where truck and crawler mounted units cannot work.

MOBILITY. Tractor-mounted unit moves easily and quickly from job to job under its own power and is ready to dig on arrival.

STABILITY. Individually controlled hydraulic outriggers allow operation from a level position . . . hold tractor in place.

VERSATILITY. Digs in any kind of ground . . . over 10 feet deep at speeds comparable to any conventional backhoe. Hydraulic controls give boom down pressure for fast digging . . . a full bucket every time.



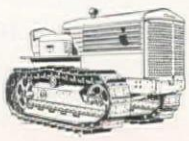
A Swing Loader Bucket Attachment is available for use with the Oliver-Ware Hydro-Trencher and can be installed in a few minutes.

THE OLIVER CORPORATION

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

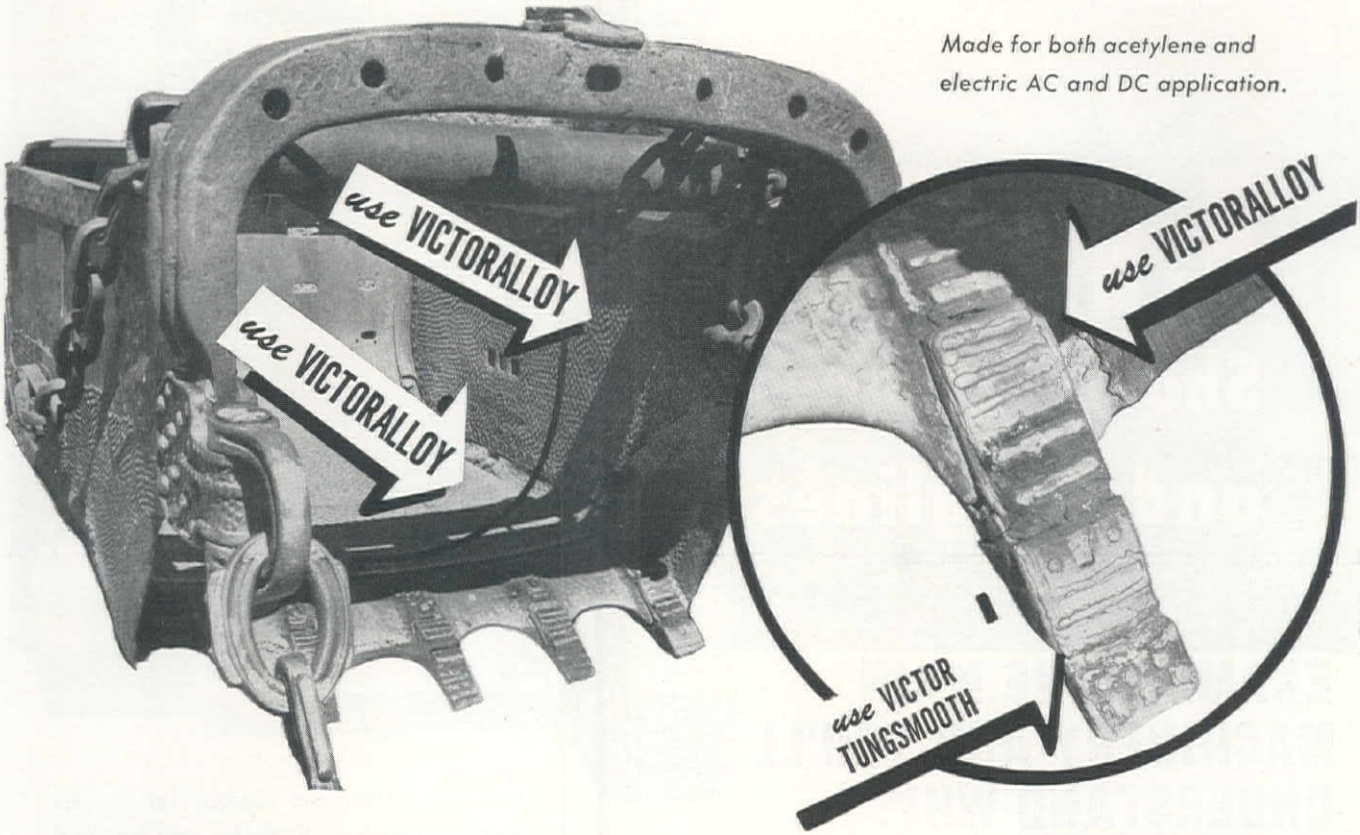
A complete line of Industrial Wheel and Crawler Tractors



State of Arizona: Guerin Implement Co., Phoenix, 1401 S. Central St.; ***State of California:*** Gustafson Tractor Co., Eureka; Mechanical Farm Equipment Dist., Inc., San Jose; Ashton Implement Co., Salinas; Comber & Mindach, Modesto; Cal-Butte Tractor Co., 820 Broadway, Chico; Tractor & Equipment Co., San Leandro; Flood Equipment Co., Sacramento; W. J. Yandle Co., Santa Rosa; Jim Ingle Co., Fresno, Hanford and Tulare; Oliver Implement Co., Bakersfield and Shafter; Turner & Chapin, Whittier and Covina; Farmers Tractor & Implement Supply Company, Colton. ***State of Washington:*** Inland Diesel & Machinery Company, Spokane; Pacific Hoist & Derrick Co., Seattle and Puyallup; Melcher-Ray Machinery Co., 202 East Alder Street, Walla Walla; Central Tractor and Equipment Co., Wenatchee. ***State of Oregon:*** Loggers & Contractors Machinery Co., Portland, Eugene and Klamath Falls. ***State of Idaho:*** Idaho Cletrac Sales Co., Lewiston and Cottonwood; Engineering Sales Service, Inc., Boise. ***State of Montana:*** Western Construction Equipment Company, Billings and Missoula. ***State of Nevada:*** B & M Tractor & Equipment Corp., 1420 S. Virginia St., Reno. ***British Columbia:*** Pacific Tractor & Equipment, Ltd., 505 Railway Street, Vancouver.

FASTER and SMOOTHER with VICTOR HARD-FACING ALLOYS

Made for both acetylene and electric AC and DC application.



	FOR THESE CONDITIONS	FOR SUCH EQUIPMENT
VICTORALLOY	Abrasion and severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers
VICTORTUBE	Severe abrasion	Scarifier teeth, dredge cutter blades, posthole augers, oil field tools, ditcher teeth
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides
VICTOR HS 1	Corrosion, heat and abrasion	Saw-teeth, carbon scrapers, wire guides, rocker arms
VICTOR HS 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies; cams, hot punches, pump shafts
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutter bits, brick augers, pug-mill knives, screw conveyors

VICTOR

WELDING AND CUTTING EQUIPMENT SINCE 1910

Victor Super-Titan Blasting Nozzles
Victor Fluxes
Nelson Stud Welding
Schramm Air Compressors

★

Order from your VICTOR Dealer NOW . . . or write today for descriptive folders.

VICTOR EQUIPMENT COMPANY

ALLOY ROD AND METAL DIVISION

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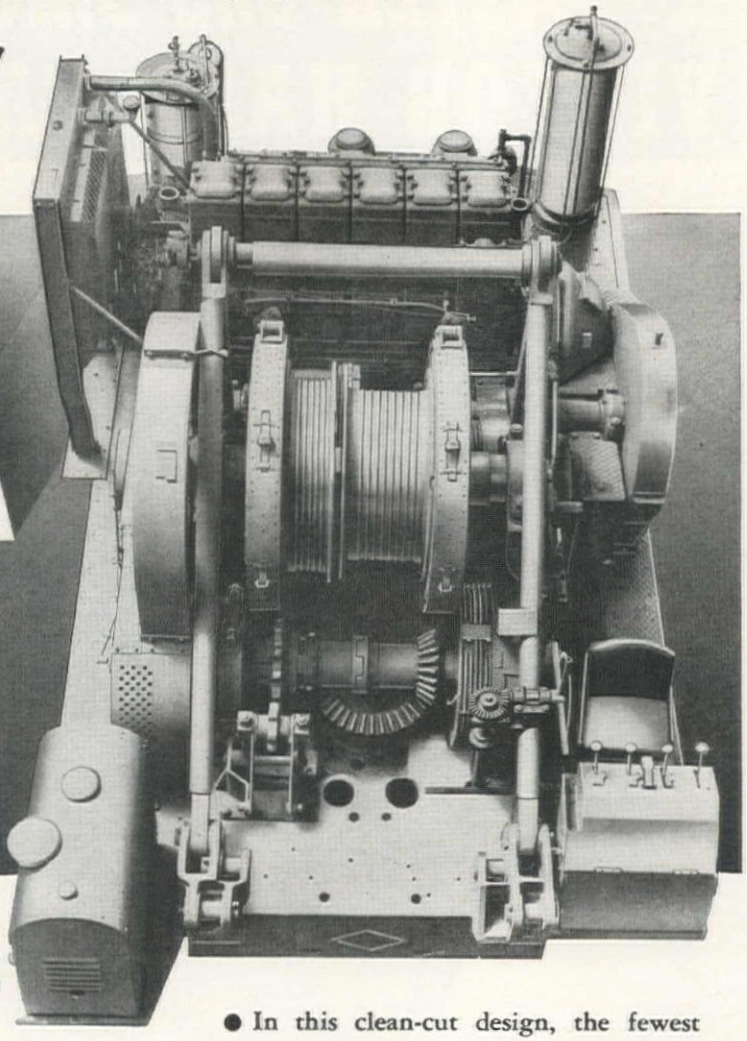
11320 S. Alameda St., LOS ANGELES, CALIF.
844 Folsom St., SAN FRANCISCO 7, CALIF.
1312 W. Lake St., CHICAGO 7, ILL.

There's a Branch or Distributor to serve you in Portland, Spokane, Seattle, Salt Lake City, Casper, Great Falls, Anchorage, Boise, Denver, Tucson, Phoenix, Albuquerque, Oakland, San Diego, Fresno, Ventura, Sacramento.

Built-in STAMINA *cuts*
"DOWN-TIME"
of
LIMA
Shovels, Cranes and Draglines



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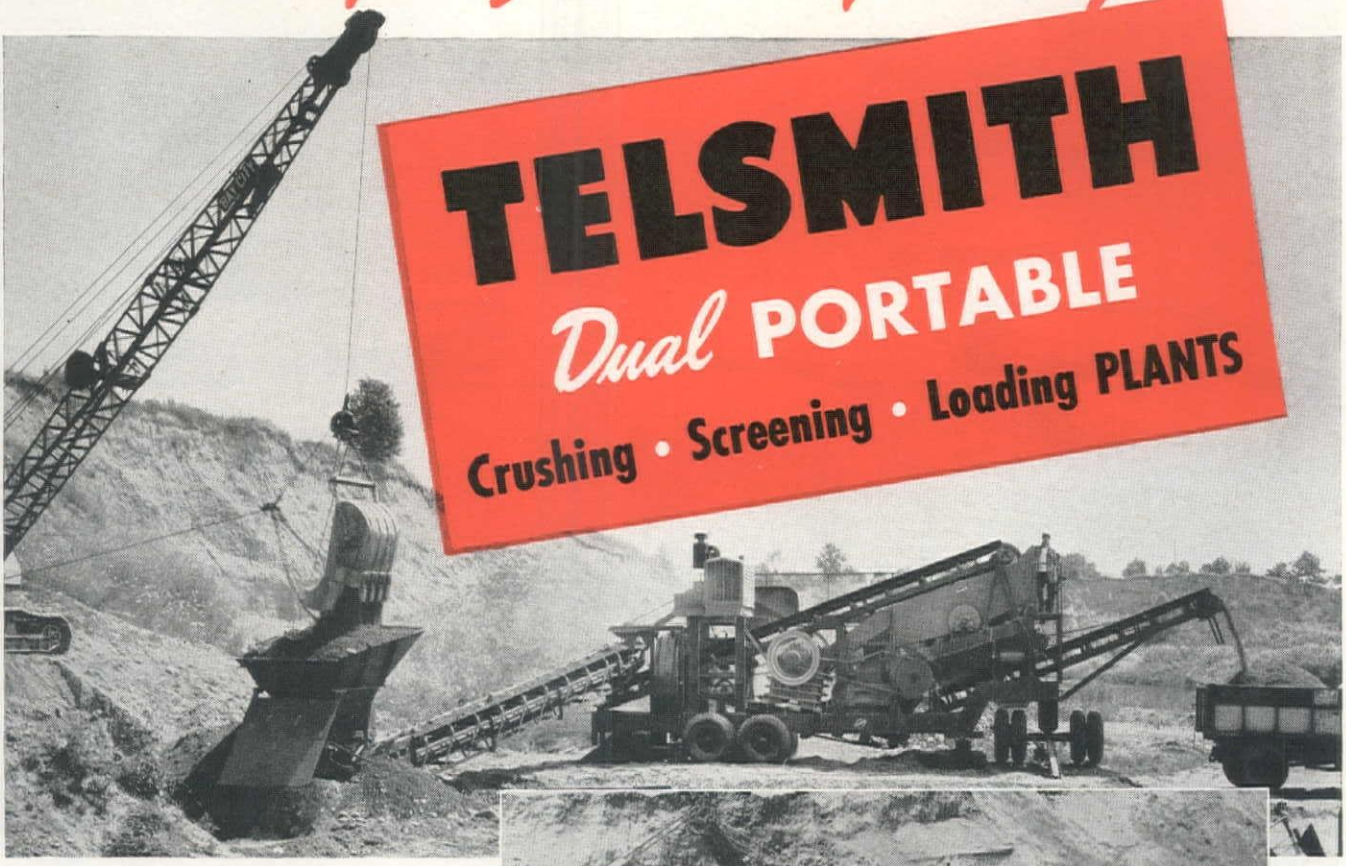

9-B TELSMITH Dual PORTABLE *(above)* with field conveyor and hopper, owned by Lyle J. Walker and operating near New Hudson, Michigan.

NEW 7-A TELSMITH Dual PORTABLE *(right)* with plant hopper, owned and operated by Tri-County Sand & Gravel Co., Pulaski, Wis.

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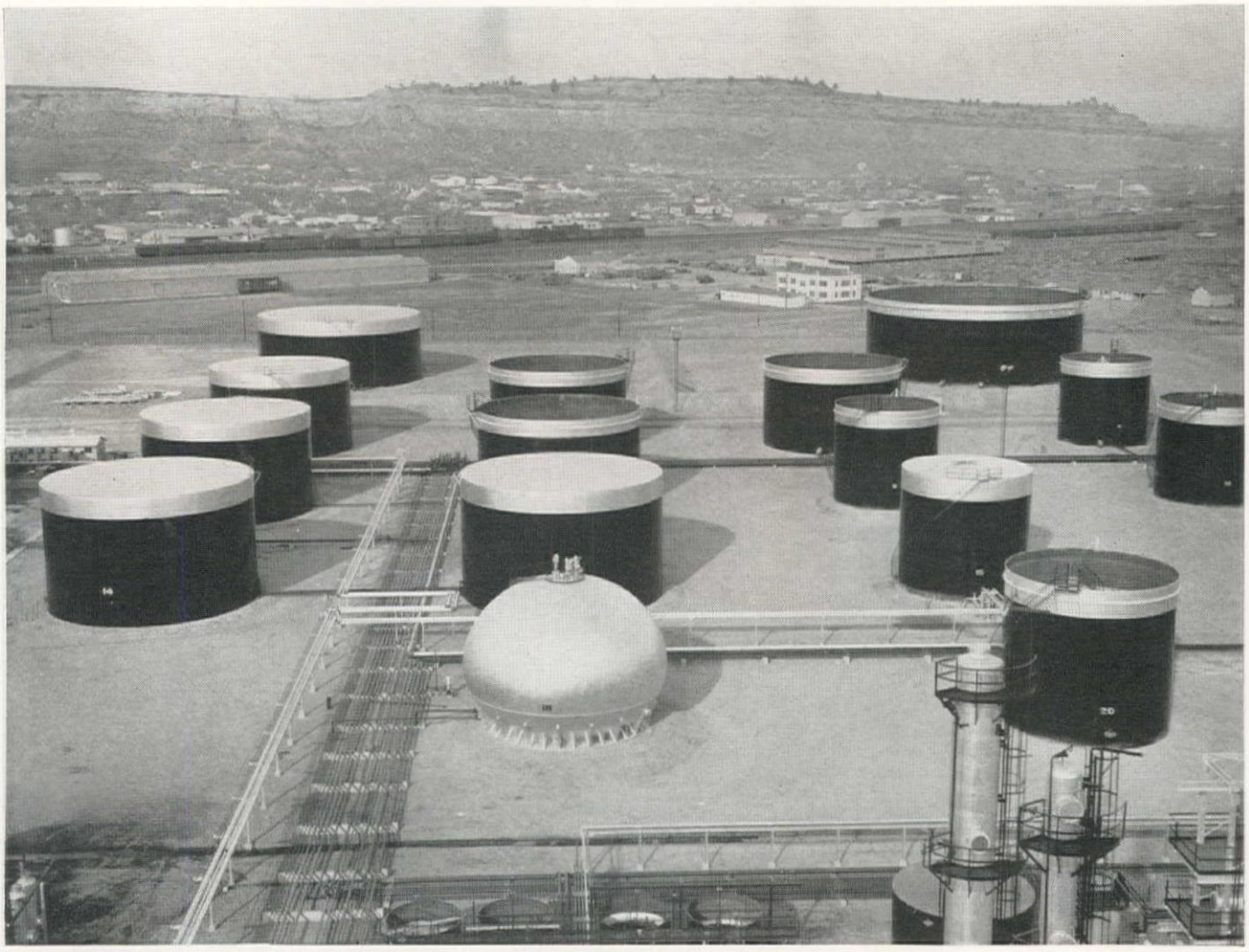

Modern Refinery Practice Demands *Scientific* Storage Selection

The above view of the Continental Oil Company's refinery at Billings, Montana, illustrates an important point—that modern refiners approach the storage problem *scientifically*. They consider the product and service involved and then select the tank that does the best overall job for those conditions.

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WESTERN CONSTRUCTION NEWS
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April 15, 1950 Vol. 25, No. 4

1950 Is Off to a Good Start

FIGURES on the national volume of construction in January show a 16% increase over a year ago. The total for private work, according to the report of the Department of Commerce, is up 14%, and public work is up 24%. This increase is in line with most of the predictions that were made for 1950. But, it is reassuring to report actual figures showing that the predictions have developed into fact. With the backlog of proposed work continuing in undiminished volume, and the Western figures confirming the national trend, the industry can take its eye off the curve and make plans for getting into the spring rush of a big year.

Re-use Is Good Engineering

A FULL and useful life for materials of construction indicates good engineering skill and economy. This talent need not be confined to large jobs, and two examples in this issue apply the idea to small county projects. In one, a county made effective use of surplus war material for building a small suspension bridge (front cover). In the other, treated timbers, salvaged from an ocean wharf after long service, were an inexpensive answer to building wing-walls at bridges. In the broadest appraisal this engineering principle of re-use deserves praise as making the fullest use of our natural resources. In a more direct view this type of practical design shows engineering alertness in applying available engineering materials to solve local problems. And in a final sense it represents smart personal engineering, because county officials, and the public, like their engineers to point to examples of getting the most out of public funds.

Competition Is Shaping Contracting

CONTRACTING organizations are shaping into the pattern for the immediate years ahead. Competition, which was widely aired at the recent convention, is the force. The evidence is found in the continuing decline in bids below the corresponding engineers' estimates. With the curve of material costs remaining relatively unchanged during the year, the downward cost of construction is reflecting some improvement in labor efficiency, the application of increasing ingenuity on the job, but—most important—an increasing urge to get the contract. Contracting is now experiencing the process which swept through many branches of the manufacturing industries about two years ago.

For example, dozens of small manufacturing plants got started during the war in the field of radio and electronic parts and appliances. They lacked background, experience and a sense of costs, but could make a product of satisfactory quality when price was no factor. Immediately following the war these new-comers entered the bonanza period when the public pulled consumer goods off the store shelves without much regard for quality or price. Then came the cold dawn. It was necessary to begin to compete for business. Lack of experience, resources and personnel began to tell. The ranks were thinned and the old established firms, together with a few of the smarter beginners, established the new pattern of the industry.

The parallel is by no means exact, because contracting and construction followed a different wartime pattern. But there are many similarities. The expanding volume of construction work during the immediate postwar years delayed the change in the construction "market." But, today the inevitable forces of competition are beginning to mold the new pattern. Engineers, construction men, manufacturers of construction equipment and distributors would do well to watch the active contractors and their bidding during the season just ahead. The names, firms and organizations that remain in prominence will settle into the pattern which will represent the contracting industry for the coming years.

Material Prices—and Strategy

IF CONTRACTORS would like to secure the advantages that come from supplying the materials as a part of the general contract, perhaps a change in approach might work. Public officials are interested in getting construction projects done at minimum cost. The price for the materials going into the job, and the method of purchase and delivery are important factors. As to the methods of obtaining these materials, there is a well recognized lack of uniformity.

A resolution passed at the recent convention of the Associated General Contractors recommended that agencies draw up contracts which would make the procuring of materials part of the general contract. Statements made in open meeting indicated clearly that certain inconsistencies are generally understood within the industry. On the one hand contractors are sure that on most jobs their relations with suppliers of materials permit them to obtain better prices than a public agency can from open bidding. On the other hand contractors are not interested in divulging these particular figures to their competitors, other suppliers, or the contracting agency. These material prices remain part of the bidding strategy. Thus, unit bids for steel, cement and other materials are frequently masked by putting them comfortably on the high side.

When the public officials of the agency—as distinct from the engineers—spot these figures, the general conclusion is that it is in the public interest to purchase materials direct. Since it is generally accepted that these figures are masked, the situation is understood by contractors, suppliers and engineers. Thus it would not conflict with recognized bidding practice and might be interesting to reverse the masking process—with figures comfortably below rather than above accepted prices. The result could promote a modified reaction on the part of public officials.

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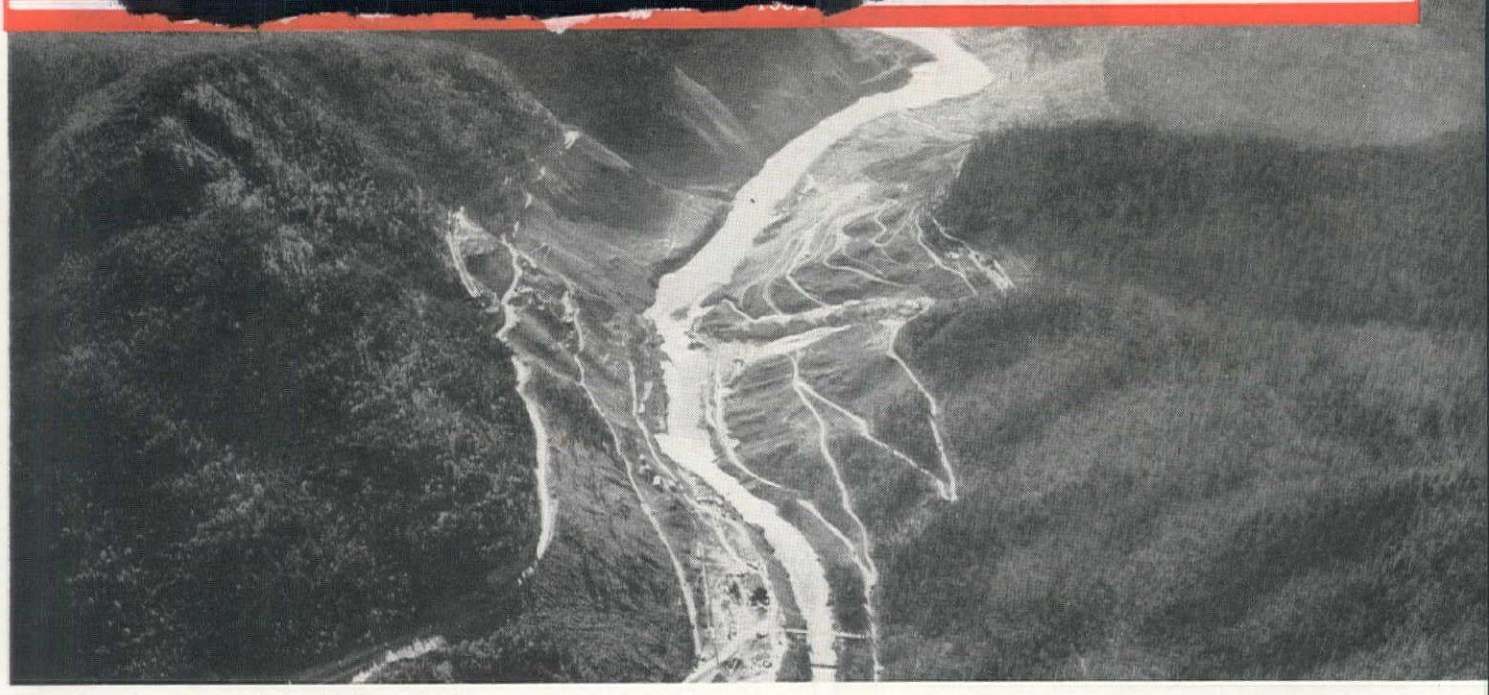


Part I *of a Two-Part Article Describing—*

Concreting Methods at Hungry Horse

During 1950, more than 1,000,000 cu. yd. of concrete will be placed in the main dam structure—General-Shea-Morrison has spent 15 months designing and building an efficient construction plant to do this big Montana job

By

W. E. WHEELER
Chief,
General Engineering Section
Hungry Horse Project
Bureau of Reclamation
Kalispell, Mont.

SIX YEARS after authorization by the Congress of the United States, Hungry Horse Dam is fast becoming a reality. Born of a wartime necessity for additional power and as an alternate to an unpopular proposal for raising the Flathead Lake, the project is expected to greatly affect the future economy of the Pacific Northwest.

Hungry Horse Dam is being constructed by the Bureau of Reclamation on the South Fork of the Flathead River, 20 mi. northeast of Kalispell, Mont. Because it is a key unit in the development of the Columbia River Basin, it is fitting that it should be, when completed, the third highest and fourth largest concrete dam in the world. Its 564-ft. height is exceeded only by Hoover (726 ft.) and Shasta (602 ft.), and its 3,000,000-cu. yd. volume by Coulee (10,585,000 cu. yd.), Shasta (6,541,000 cu. yd.), and Hoover (3,245,000 cu. yd.). It will form a reservoir impounding 3,500,000 ac. ft. of water. A total of 285,000 kw. of power will be generated at the site, and the release of water during the winter low water season will firm up power generation at constructed or authorized downstream plants by another 515,000 kw.

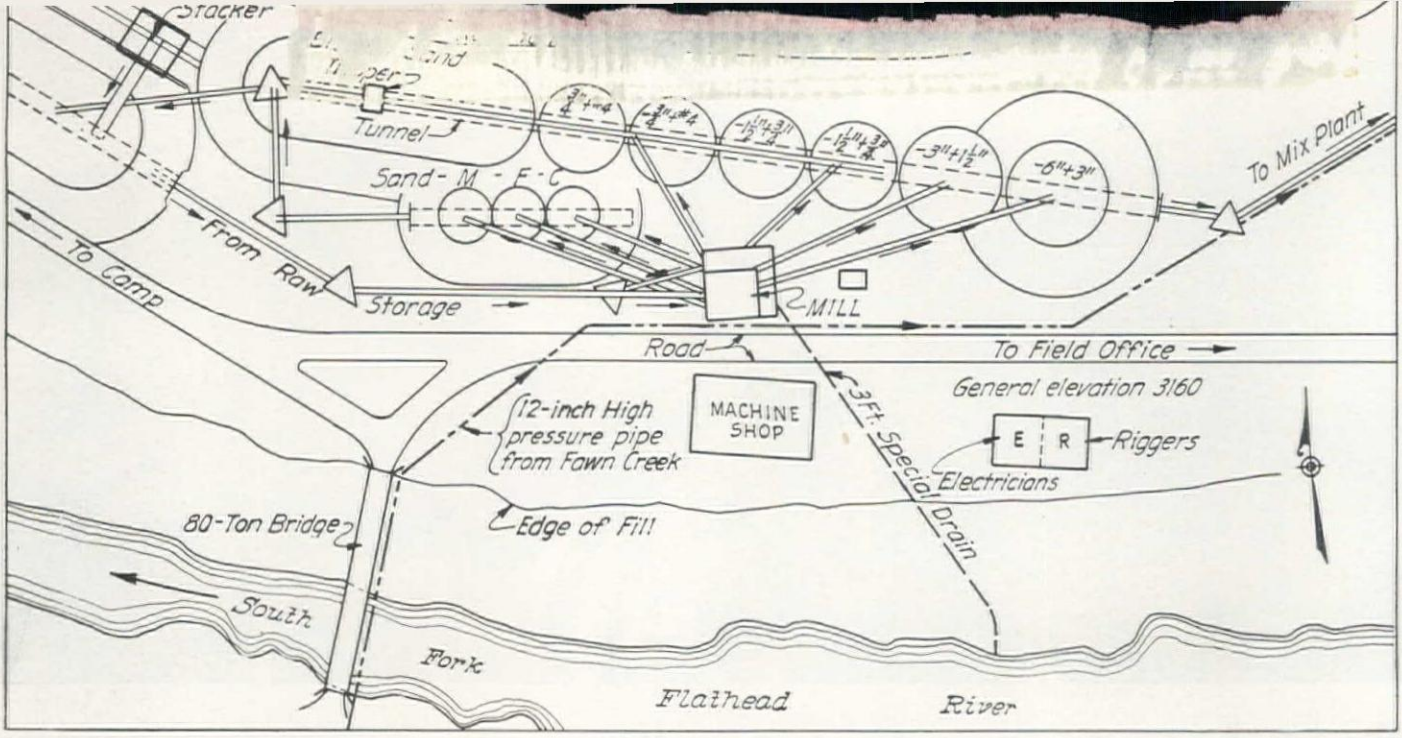
Five years of preliminaries

Five years ago a small crew of Bureau men started preliminary work on the project, making reconnaissance and detailed surveys to select the most suitable and economical damsite, locating roads and laying out the camp and water system. Diamond drill explorations were started to explore thoroughly a suspected buried channel leading from the reservoir 2 mi. east of the damsite. Preliminary drilling seemed to confirm this belief as one hole approximately 600 ft. deep encountered only glacial till and gravel. Continued work by a seismograph crew from the Denver laboratories finally showed that a "bedrock high" extended across this valley. Diamond drill explorations confirmed the findings of the seismologists and the bedrock high was located with its low point only 17 ft. below the maximum highwater surface of the reservoir.

While the drilling program was going forward, the Denver design offices had started studies on a concrete dam to fit topographic and foundation conditions based on field data and observations as to depth of overburden and general rock conditions. First plans contemplated a straight gravity type dam with a center section overflow spillway similar to Cou-

Articles on the Hungry Horse Project

Complete unit bids for construction of Hungry Horse Dam and Powerhouse appeared in the June, 1948 issue of *Western Construction News*.



lee Dam. With further data obtained by diamond drilling and exploration tunneling, it was determined that substantial savings could be effected by constructing a gravity-type arch dam.

During the design and specification writing period, the small field staff at the dam had placed under contract and supervised construction of the 4-mi. access road to the location for the top of the dam, constructed 100 residences, an office building, a concrete laboratory, a steel warehouse, streets, water and sewer systems and the electrical distribution system for the camp. In addition to these, contracts were let in 1947 for the clearing of 1,335 ac. of the dam and reservoir site, and for excavation of the diversion tunnel. The construction of the diversion tunnel was the first major work to be performed at the damsite.

Out of the pre-construction stage

The 36-ft. diameter, 1,180-ft. long tunnel under the right abutment was driven by the Guy F. Atkinson Co. during the 1947-1948 winter and spring. Near-record floods of the South Fork occurring in May and June of 1948 overtopped the upstream cofferdam and flooded the workings. A jumbo drill truck and some minor equipment were flooded.

With award of contract to General-Shea-Morrison of Seattle on April 21, 1948, the project was definitely out of the pre-construction stage. A review of accomplishments shows that General-Shea-Morrison proceeded immediately with construction of the power plant service road along the river, excavation of the left abutment, excavation of the spillway tunnel, construction of the gate structure at the upstream portal of the diversion tunnel and the building of a construction plant and related facilities.

The first bucket of concrete

On September 7, 1949, at 4:10 p. m., the first 8 cu. yd. of concrete were swung out from the mixing plant and placed in the Hungry Horse dam at elevation 3001, the lowest bedrock point in the foundation of the dam. Placing of this concrete marked the end of 15 months of construction by the prime contractor, General-Shea-Morrison, on the principal plant facilities required to build the Hungry Horse dam and power plant.

On a job of this size, an elaborate and complex plant is required to manufacture the concrete. Processing the aggregate into the several sizes and then recombining with cement, pozzolan, and water into concrete must be performed rapidly and efficiently. Speed in placing this concrete is necessary, and the contractor's program for construction on the several features must dovetail exactly to enable him to meet contract requirements.

It is estimated that approximately 2,500,000 bbl. of cement will be required, and this is being purchased from three different producers in northern Montana and Washington. As an economy measure and to increase the workability of the concrete, pozzolan is being used. Up to 50% by weight of pozzolan may be used, replacing an equivalent quantity of cement, without decreasing the strength of the finished concrete. The pozzolan, sometimes referred to as "fly ash," is a waste product from large coal-burning industrial plants of the Chicago area. The contractor is responsible for supplying and handling the 130,000 tons (925,000 bbl.) which will be required.

Special railhead facilities

The railhead for the Hungry Horse project is at Coram, 6½ mi. by road from the dam. Since this part of Montana has considerable rain, snow and fog, it would require that the cement be unloaded in weather-tight buildings. To meet this condition, special plant facilities for unloading, handling and storing this large volume of cement and pozzolan were constructed. They consist of an unloading platform and building 320 ft. long, which will shelter six railroad

THE GENERAL-SHEA-MORRISON CO. is a combination of twelve firms including the following: General Construction Co., Portland, Ore.; The Shea Co., Alhambra, Calif.; Morrison-Knudsen Co., Inc., Boise, Idaho; F & S Construction Co., Butte, Mont.; J. L. McLaughlin, and J. Birch & Sons, Great Falls, Mont.; Pacific Bridge Co., San Francisco; Kaiser Co., Oakland, Calif.; Walsh Construction Co., New York; Peter Kiewit Sons' Co., Omaha, Neb.; J. C. Boespflug Construction Co., Seattle, and Gilpen Construction Co., Portland.

THE SCREENING plant and aggregate storage area. At left are finished product stockpiles. Sand piles on right are, front to rear—medium, coarse and fine. Compare this view with the flow diagram on the opposite page. At right, a general view of the raw aggregate stockpiles and stacker. An underground conveyor carries this material to the screening plant.

cars at one time. Beneath the tracks are 14 bins for storing cement and 6 bins for pozzolan, with a capacity of 20,000 bbl.

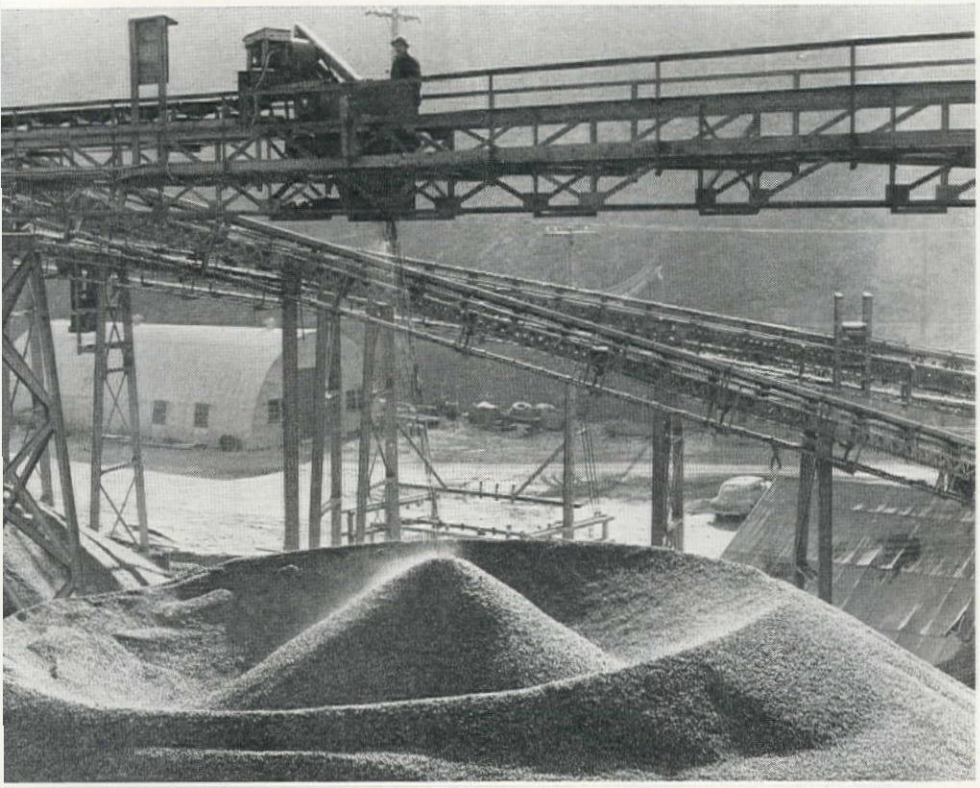
Haul units carry 42 tons

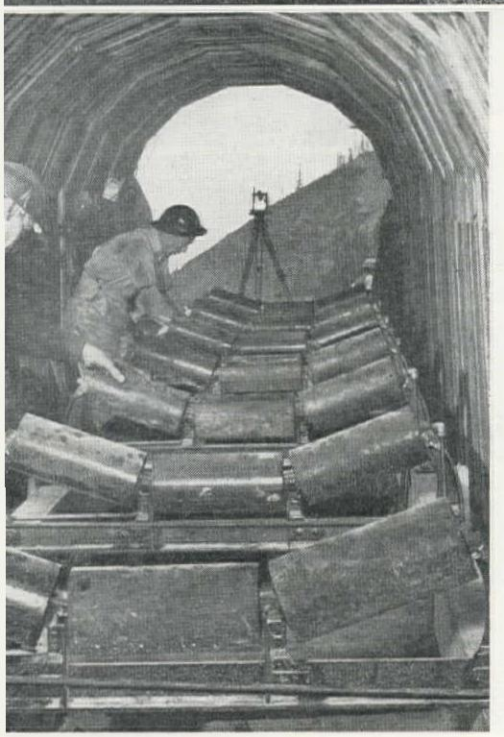
Three steel-bodied covered semi-trailers, with bottom dumping gates, will be used for hauling the cement and pozzolan to the silos at the damsite. Each unit has a capacity of 880 cu. ft. and will haul 42 tons of cement or 31 tons of pozzolan. The reason for this difference in weight lies in the fact that one cubic foot of cement weighs 94 lb., compared to pozzolan's weight of 70 lb. per cu. ft. The above-mentioned bins have unloading hoppers at the bottom which permit loading directly into the tops of the trailers. The cement will be hauled over U. S. Highway No. 2 for a distance of 2.0 mi. before it reaches the 4.0-mi.-long upper access road. At the same elevation as the top of the dam, the trailers back onto a covered unloading dock to discharge their loads into a hopper, from which material is conveyed by belt to the cement or pozzolan silo. The cement silo has a capacity of 7,300 bbl., and the pozzolan silo 5,000 bbl. From the storage silos the cement and pozzolan is again picked up from the bottom by conveyor belts and transported to smaller storage bins within the mixing plant.

The aggregate deposit is located 5 mi. downstream from the dam, at the confluence of the South Fork of the Flathead with the main stream. An area of 110 ac. has been purchased by the contractor to provide the approximately 4,000,000 cu. yd. of sand and gravel which will be required in constructing Hungry Horse Dam. This deposit of aggregate is overlain by top soil varying from 2 to 4 ft. in depth at an average elevation of about 15 ft. above low water elevation of the rivers. A Bucyrus-Monighan walking dragline with a 165-ft. boom, using a 10-yd. bucket will scoop this material from as much as 25 ft. below the water's surface. Twenty-five-yard Euclid truck-trailer units will haul the aggregate the 4½ mi. to the storage area and the screening plant.

Haul road for gravel

Two miles of the haul road follows along the river before joining with the power plant service road, and will be used exclusively by the contractor for hauling gravel. Near the aggregate pit, the haul road crosses under U. S. Highway No. 2 by following the river bank under the highway bridge which spans the South Fork of the Flathead. During extreme high water in the spring, the road under the bridge may be flooded and made inoperative for a short period





SCREENED AGGREGATE, above, being discharged from conveyor onto a stockpile. Crater is caused by removal of aggregate through a conveyor tunnel. At left, rollers for the 36-in. conveyor belt being installed. Belt delivers aggregate to top of screening mill.

of time. The power plant service road, also known as the lower access road, which was constructed by General-Shea-Morrison, will be the principal road for hauling all equipment and machinery to the power plant during construction, and will serve as a haul and access road after construction.

Handling pit run gravel

At the end of the haul, the pit run aggregate is dumped into a receiving hopper, from which it is conveyed by belt to the primary (scalping) screen. Oversize (rocks larger than six inches) goes through jaw crushers and is returned to the conveyor, which carries the material to the stacker. Gravel from the main belt is unloaded onto the stacker by threading the belt through rollers which shape the belt into a flattened "Z," thus dumping the material from the top of the "Z." The stacker, mounted on rails, moves along the belt and deposits the material at right angles in one huge pile over an 800-ft. long recovery tunnel. More than 400,000 tons in dead storage and 150,000 tons in live storage is thus ready for future use in the event of a major breakdown at the gravel pit.

Choice of gravel deposits

The screening plant has been carefully constructed to fully meet the requirements of producing aggregate and sand in sizes which will produce the strongest and most workable mixture. An abundance of gravel is to be found along most of the rivers in northwest Montana, Nature's own aggregate plant operated thousands of years ago to produce, crush and size this material and to deposit it in convenient stockpiles along the rivers and at the mouths of small tributary streams. This gigantic natural aggregate plant was the Ice Cap which blanketed Canada and Montana during the Ice Age. The movement and melting of this ice crushed, ground and sized the gravel as it was carried down to lower elevations.

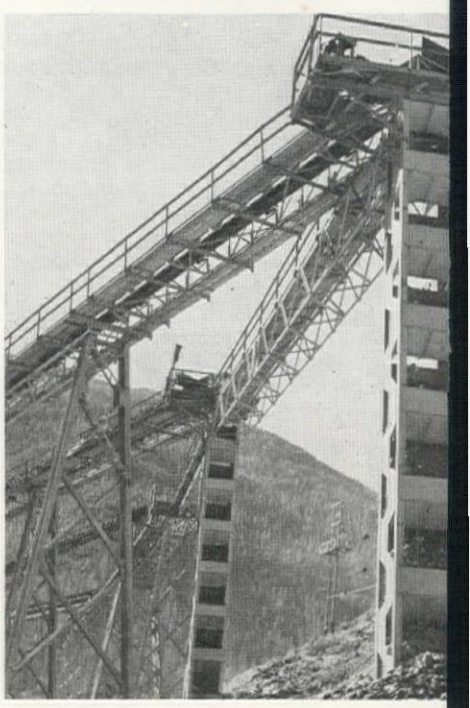
Gravel deposits located 2 mi. upstream from the damsite were explored and tested by Bureau field forces and were found to be suitable for the work. The contractor was furnished with this information, but was not compelled to use these materials. Prior to submittal of bids, General-Shea-Morrison made preliminary investigations of several deposits from 5 to 8 mi. down the valley from the dam. After the contract was awarded, intensive investigations were made of the closest area, which revealed that the material was of suitable quality and quantity if excavated to below river depths. Permission was given to use this area in lieu of the Bureau-selected deposit.

There were two primary considerations for the decision to use this deposit rather than the upstream deposit. To develop a site for storage yards, screening plant and mixing plant in the steep canyon upstream from the dam would have been an expensive undertaking, yet would not have provided sufficient plant capacity. Secondly, the specification requirement to start water storage in the reservoir in the spring of 1952, would result in flooding the gravel deposit and requiring stockpiling of approximately 1,000,000 cu. yd. of material to permit the continuing of concreting operations during 1952 and 1953.

Method of hauling gravel

After selection of the aggregate area, studies were made to determine what method of haul to use—bucket tramway, conveyor belt, railroad, or truck. Weather conditions ruled out the first two. Rain and snow and freezing weather would have required the use of covering over the belt. Further, two crossings of the river would have been necessary. The railroad was eliminated early in the planning stage as being too expensive because of location problems. In going to truck and trailer units, full use could be made of the end-dump trucks which had seen duty on excavation work at the damsite by removing the body and equipping the truck unit for a trailer. Trucks would be more flexible, hauling as much as the concreting

ROCK LADDERS in the aggregate storage area shorten falls to minimize rock breakage.



operations required. The breakdown of one truck unit would not immobilize the entire hauling system.

The center of the aggregate production plant is the mill. Here, coarser materials are sized and washed and a rod mill produces sand sizes lacking in the natural deposit. Gates at the bottom of the raw aggregate piles permit the material to drop onto a 36-in. wide belt which runs the length of the recovery tunnel. This belt then carries the material to the top of the screening mill, through which it is progressively sized and washed on vibrating screens to the following classes: 3-in. to 6-in. cobbles, 1½-in. to 3-in. cobbles, ¾-in. to 1½-in. gravel, #4 to ¾-in. gravel.

Sand Production

Sand is the final product and is produced in three sizes—fine, medium and coarse—and deposited in separate piles over another recovery tunnel. Blending is accomplished by regulating the flow of each size sand by means of weighing feeders attached to the conveyor belt system, which takes it to the sand stockpile. A tripper on the belt permits the stockpiling of 25,000 tons of blended sand in one large oval-shaped pile. The other size aggregates are stockpiled over the same recovery tunnel in piles varying from 3,200 tons to the 5,600 tons in the 3-in. to 6-in. cobble pile. The blended sand must meet the following grading requirements:

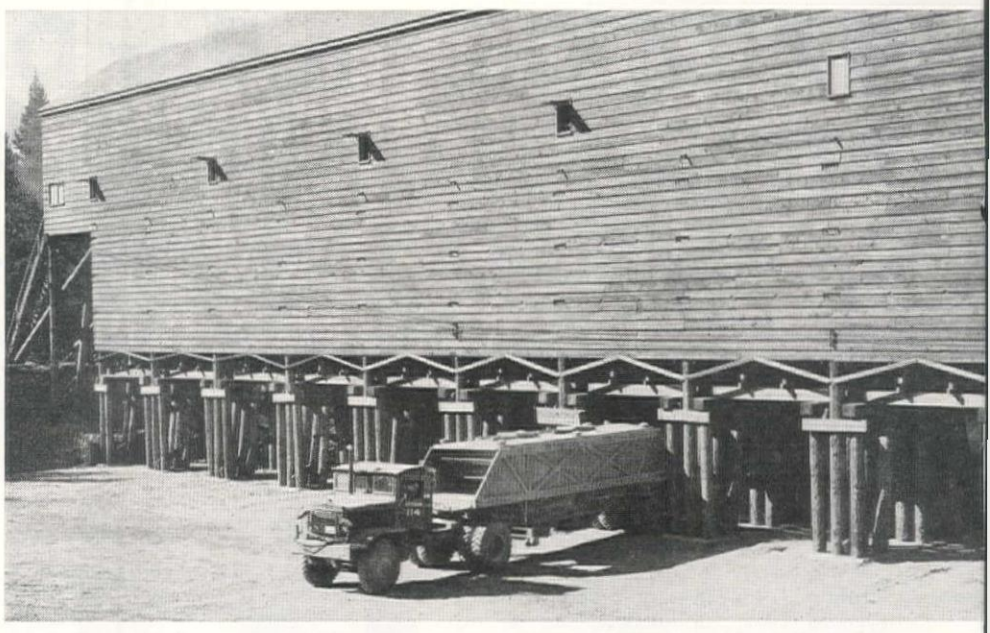
Screen No.	Per Cent Retained
4	0 to 5
8	10 to 20
16	10 to 20
30	10 to 30
50	15 to 35
100	12 to 20
Pan	3 to 7

There are no requirements to meet a certain fineness modulus, but hourly samples cannot vary more than 0.2 from the average of the last ten samples. For example, if the average of ten samples gives a fineness modulus of 2.65, then the eleventh sample should read between 2.45 and 2.85. Actually, the grading of the sand used so far comes within 0.1 and consistently runs a fineness modulus of 2.90. A deposit of good blending sand has been located in the camp area and if it proves of sufficient quantity the rod mill may have to be operated only occasionally.

A 36-in. wide sectionalized belt carries the individual sizes from the recovery tunnel to the top of the 139-ft. high mixing plant, where it is screened to remove the undersize before it is stored in its respective bin from which the mixer is charged. Undersize from the No. 4 screen is wasted. Sand is not screened.

Solving water requirements

To meet water requirements for such an operation would ordinarily present quite a problem. Not so at Hungry Horse, as the next creek downstream from the damsite drains an extensive watershed on the northeast side of Columbia Mountain. Late-melting snow banks maintain the runoff of this icy stream even in late summer. A 16-in. wood stave pipe line 7,500 ft. long slopes gently upward from the top of the dam at elev. 3565 to tap Fawn Creek at elev. 3800, thus providing a working head of 600 ft. at the screening plant through a 12-in. spiral-welded high-pressure steel pipe which crosses the South Fork on the 80-ton capacity steel construction bridge. This line continues on to provide water service at the mixing plant. Fawn Creek water is also used for concrete cooling without refrigeration.



CEMENT TRAILER of 880-cu. ft. capacity backed under loading shed at the railhead 6½ mi. from the damsite. Trucks already used at damsite were equipped to pull the trailers.

PART 2 of the foregoing article, in next month's issue, will describe the concrete mixing plant, the cableway system, procedures for placing concrete, and plans for the next two years.

Eight-Foot Balls to Clear Slopes

AN INGENIOUS land-clearing scheme is being tried this spring for clearing the remaining 14,695 ac. of the Hungry Horse reservoir area. Hooked together with heavy logging chains, 8-ft. diameter steel balls (see cut) will be used by Wixson & Crowe and J. H. Trisdale, clearing contractors, both of Redding, Calif., to snag down brush and small trees on the steep hillsides in the reservoir area. Tractors will be used to drag the 4½-ton balls down the hillsides with about 30 ft. of chain between each ball. Purpose of the balls is to hold the chain at a constant elevation of 4 ft. above the ground so that the chain will not hang up on large stumps that have been left during logging operations. Earlier clearing operations of the same contractors were described in the November 1949 issue of *Western Construction News*. A tabulation of the unit bids for the clearing work on which the balls will be used is presented on page 132 of this issue.

970.6 Cu. Yd. Per Day—
Atkinson Sets All-Time Paving Record

Guy F. Atkinson Co. averages 970.6 cu. yd. per 8-hr. day on a section of Portland cement concrete pavement in Southern California to establish a new record — Described here are conditions, equipment and procedure

By
GEORGE R. BARRY
Resident Engineer,
California Division
of Highways
Sacramento, Calif.

AN ALL-TIME national record for speed in pouring Portland cement concrete for highway construction was established recently by the Guy F. Atkinson Co., South San Francisco, Calif. The contractor's average output per 8-hr. day on construction of a 4-lane divided highway between Atwater and Livingston in Merced County, Calif., was 970.6 cu. yd., surpassing a previous record of 806.1 cu. yd. set in 1948. Highest production average during 1948 in California was 776.4 cu. yd.

Work on the project was begun on October 14, 1948, and completed on October 18, 1949. Included in this period were 57 unworkable days because of inclement weather.

The new construction parallels the Southern Pacific Railroad, through rolling orchard and vineyard land with sandy soil. This section of highway is one of the busiest of U. S. Highway 99, and is a connecting link in the overall planning for an ultimate divided highway between the San Francisco Bay area, Central California and Southern California.

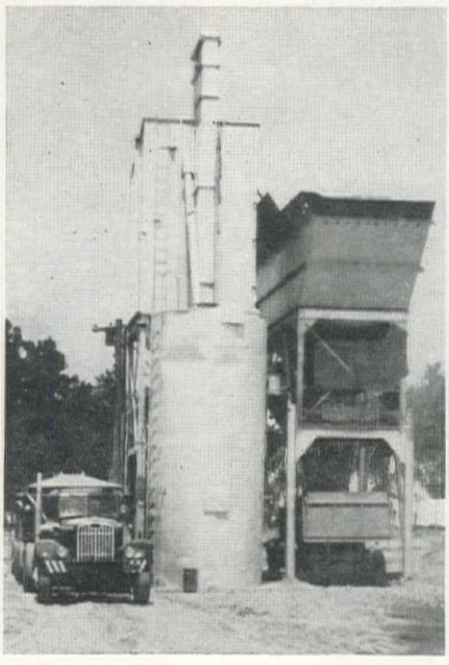
Construction requirements

The work consisted of constructing graded roadbeds for a divided highway, together with the necessary roadbed for an outer highway; paving with Portland cement concrete on cement-treated subgrade; surfacing with plant-mixed surfacing on untreated rock base; placing plant-mixed surfacing borders and untreated rock base shoulders; applying seal coats; constructing cross-overs; and constructing Portland cement concrete curbs and gutters in addition to the construction of drainage structures, canal structures and the various other miscellaneous items required in a project of this magnitude.

Some of the details of operation and the equipment used are shown in the accompanying pictures. The several operations are discussed in sequence, covering the high points of the work.

Roadway excavation was performed with graders, tractors and scrapers. Compaction was obtained with sheepsfoot rollers coupled in tandem in conjunction with a pneumatic-tired roller attached behind the sheepsfoot tampers. These were supplemented by the use of a grader when results indicated adequate compaction was not being obtained.

BATCHING PLANT, 19 mi. from the job site. Haul was by bottom-dump trailers.



Preparing subgrade area

The area for cement- treated subgrade was prepared and shaped to approximate grade and cross-section for the top of the cement-treated subgrade and thoroughly compacted before the placing of header boards; grade was shaped to blue tops placed 0.10 ft. high. After side forms were placed, the grade was cut to 0.01 ft. below subgrade elevation for Portland cement concrete with a Lewis subgrader. This operation of cutting the subgrade 0.01 ft. low upon completion of the cement treatment brought the final elevation for pavement subgrade within allowable limits without excessive waste of the cement-treated material in the final trimming operations.

The area for cement treatment consisted of the full lane width of 12 ft. by a depth of 4 in. This was accomplished by the use of a machine riding on the headerboards. This machine was equipped with scarifier teeth and cutting blades which scarified, cut and windrowed the material to the specified depth. Scarifier teeth and blades were adjustable to allow for wear. The equipment was constructed and operated so as to leave an undisturbed plane at a uniform depth below the surface and was towed by a tractor. The material being of a sandy nature, no unusual difficulties were encountered in pulverizing it for cement treatment.

Applying cement-treated subgrade

The evening prior to starting subgrade treatment, the area between the header boards was watered to obtain uniform moisture content. Moisture determination was made at frequent intervals for uniformity and for control during the subsequent mixing operations. Water content of the material was near the critical point and the addition of as little as 1% moisture could have interfered with the operations following the mixer. After the windrowing operation was completed, cement was spread mechanically by a specially-constructed cement tank dump truck which obtained its cement from the bulk cement bin at the batch plant. The cement was deposited into the spreader from the cement tank truck through three manually operated and controlled gates. The spreader distributor consisted of a screw-feeder working against a pressure plate. The spreader and screw were operated with an air motor. Vibrators were attached to the truck tank body to keep the cement flowing uniformly. The truck was also equipped with a tachometer so that uniform driving speeds could regulate uniformity of spread by synchronizing the speed of the truck with that of the air motor on the spreader.

Mixing equipment followed immedi-

THE HIGH consistent daily production on the job was due primarily to the efficient organization and supervision of the work by DAN MORRISON, right, project manager for the Atkinson firm, and KENNETH CORNELL, job superintendent.

ately behind the cement spreader. This consisted of a Wood's road-mixer, towed by a tractor. The proper amount of water was introduced through the mixing machine to obtain a uniform mixture and maximum compaction. Water was obtained by the mixer from a water tank truck attached to the mixer. A spreading device riding on the side forms and towed by the mixer spread the mixed material to a uniform thickness and density and to the proper depth to produce a subgrade of uniform thickness. The spreader was equipped with adjustable wheels for depth and a blade device with a manually-operated screw arm for controlling the lateral distribution of the mixed material for uniform and equal distribution on the subgrade.

Compaction of subgrade

A 3-axle type 12-ton roller was used for initial compaction after the mixing and spreading operations. A specially-constructed blade tool riding on the side forms, and equipped with adjustable cutting blades was towed by the roller for trimming the subgrade after initial compaction. Excess material, if any, from this operation was deposited on the shoulders for incorporation with the material for shoulder subgrade. Immediately following the trimming operation, a pneumatic-tired roller rigidly attached to a water truck was used for final compaction. This equipment was outfitted with a fog spray for wetting the subgrade as required.

Subgrade the key operation

The work of preparing, mixing and shaping the cement-treated subgrade was conducted as a continuous train, with all operations closely coordinated. This was considered the key operation, since the concrete paving operations depended directly upon the progress of the cement treatment. The completed mixture was cured with penetration-type asphaltic emulsion applied by means of a pressure distributor travelling between the headerboards.

All special equipment used in cement treatment was designed and built by the Atkinson Company at its South San Francisco yard.

Production of aggregates

Aggregates for the Portland cement concrete pavement were produced by River Rock, Inc., of Merced, at the firm's

A RECORD TWENTY YEARS AGO

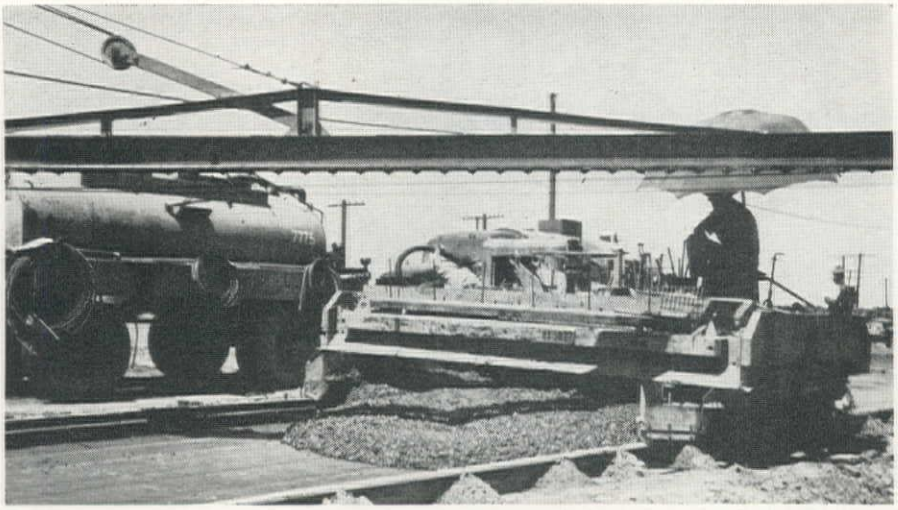
JAHN & BRESSI Construction Co., Los Angeles, established a record in 1931 when the firm's production of Portland cement concrete for a section of highway in Los Angeles County averaged 458.5 cu. yd. per 8-hr. day, according to an article in the July 10, 1931 issue of *Western Construction News*. Joe Muscolo was superintendent on that job for the contractor, and C. A. Wilson managed the project. George R. Hubbard was resident engineer for the California Division of Highways.

SETTING header boards was done after the subgrade was thoroughly compacted.

CEMENT SPREADER in operation. Note uniform windrow and undisturbed base.

12-TON ROLLER was used for initial compaction of cement-treated subgrade.

PNEUMATIC-TIRED roller attached to water truck handled final compaction.



CONCRETE was spread with a Blaw-Knox spreader, equipped with two vibrators.

FINISHING OPERATIONS. Absence of expansion joints helped speed this work.

Snelling plant. The hauling of the aggregates to the contractor's plant was performed by Miles & Son of Merced, in bottom-dump trucks and trailers. The haul for the aggregate was approximately 19 mi., and due to the large volume of concrete produced, hauling operations continued "around the clock." The production and hauling of aggregates was exceptionally well coordinated with the daily output at the plant, and at no time did the contractor curtail his plant production for lack of materials. This applies equally well to the Calaveras Cement Co. of San Andreas, which furnished the bulk cement. Considering the exceptionally large and consistent daily production, Dan Morrison, the project manager, is to be highly commended for an excellently executed and coordinated logistic operation.

Batching, spreading and finishing

A Blaw-Knox automatic batching plant was used to combine the aggregates. Aggregates were dumped onto a shuttle-feed bent, stockpiled with a conveyor belt into separate piles and fed to the batching bins by a clamshell. Five trucks of 4-batch capacity were used to haul the batched material to the mixer on the street. Mixing was done with a Ransome 34-E dual-drum mixer. The concrete was spread with a Blaw-Knox spreader, equipped with two "stinger" vibrators operating adjacent to the side forms and a vibrating bar extending the full width of the pavement, all attached on the rear of the spreading machine.

A Blaw-Knox tamper-finisher followed the spreader, making at least two passes, the time interval varying with the consistency of the mix. No expansion joints were used. Weakened plane joints, consisting of pre-molded asphaltic mastic strips were placed immediately behind the tamper-finisher's second trip over. A Johnson Float Finisher was used to finish the pavement, hand finishing being used only for edging and finishing the weakened plane joint after the installation of the mastic strips. Longitudinal and contact joints were sealed with Indaco Asphaltic Latex Emulsion.

Pavement tie-bolt assemblies were placed along the centerline joint at 30-in. intervals, and also at the end of each day's run. The nut holding the assemblies to the steel headers was removed the following day with an electrically-driven power wrench, after which the headerboards were pulled with an attachment on a tractor.

Top production of 1,188 cu. yd.

Major portion of the concrete pour consisted of two 12-ft. lanes 5.7 mi. in length. In addition, there were two 12-ft. lanes through the City of Livingston approximately 2,700 ft. in length. The contractor's average daily output was 970.6 cu. yd., with a maximum of 1,188.0 cu. yd. and a minimum of 690.0 cu. yd. All pours were made during 8-hr. days in July. There were four days on which the contractor dropped below a daily output of 1,000 cu. yd. These were caused by the comparatively short lengths of 2,700 ft. through the City of Livingston which required less than 8 hours to complete, and the ends of the runs on main lanes which were too long to finish the preceding day and not long enough to require 8 hours to complete.

Contractor's organization

The contractor at all times had a normal complement of men and equipment. All paving operations were under the direct supervision and superintendence of Kenneth Cornell, job superintendent. The methods of operation were in general practice and procedure similar to those carried on throughout California in highway construction. The high consistent daily production is due primarily to the efficient organization and supervision of the work by Morrison and Cornell, the project manager and job superintendent, respectively, together with effective coordination of all the various phases of the work involved.

Highway department personnel

The work was done under the general direction of C. E. Waite, District Engineer of the Division of Highways in Stockton, and M. C. Fosgate, District Construction Engineer. George R. Barry was Resident Engineer in direct charge of the work.

Washington Provides Job Security for Engineers

A PERSONNEL merit system designed to provide job security for employees of the Washington State Department of Highways has been instituted, according to W. A. Bugge, Washington director of highways. The plan, authorized by the 1949 Washington legislature, applies to engineering, technical, accounting, supervisory, traffic inspection, property acquiring, accounting and clerical personnel, but does not include maintenance employees.

Under the system, employees will be hired and fired solely on the basis of ability and merit. A five-member board, chosen from employees of the department to represent all major classes of employees affected by the system, will administer the plan and hear all appeals. The board is also authorized to investigate operation of the system and recommend improvements.

Members of the board are Earl C. Simpson, construction engineer at Olympia; Hudson Wickwire, equipment accountant at Olympia; Walter McKibben, location engineer at Spokane; Richard Wood, office engineer at Yakima, and William Souers, engineering draftsman at Seattle.

According to Bugge, a job classification study is now being made upon which a revised pay plan for employees of the department will be based. The new schedule of pay based on the study will become effective next September.

Asphaltic Paper Manufactured on Standard Roofing Machines Used for—

Test of Prefabricated Canal Lining

USBR places test section of a prefabricated buried membrane lining that can be manufactured easily and placed under adverse conditions by unskilled labor — It promises to provide low-cost seepage control for small canals

By
JEWELL R. BENSON
Bituminous Engineer
U. S. Bureau of Reclamation
Denver, Colo.

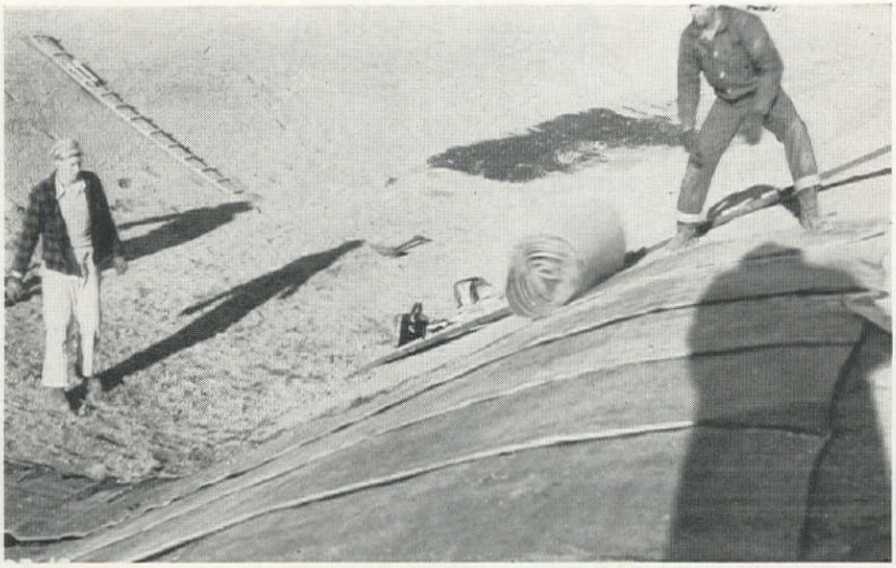
BURIED asphalt membrane canal lining of the hot-sprayed type is finding wide acceptance as a practical type of seepage control in canals and laterals. In this type of lining (see *Western Construction News*, September, 1949, "Buried Asphalt Membrane Lining Developed to Give Canal Seepage Control at Low Cost"), asphalt cement of high softening point is sprayed as a hot liquid directly on the subgrade of the canal, and a membrane of asphalt from ¼ in. to sometimes ⅜ in. or more is built up in the rapid cooling of the asphalt spray. This membrane, though surprisingly tough, might still be injured by livestock, or displaced by rapidly moving water, and would be subject to weathering if left fully exposed. These problems have been solved by the simple expedient of covering the membrane with from 1 to 2 ft. of soil or gravel, usually using the soil previously excavated in preparation of the subgrade for the membrane lining. With such protection, the life of the membrane is extended indefinitely to the extent that the protective cover is maintained.

The cost of materials, equipment and labor for construction of this type of lining is relatively low, provided that asphaltic materials may be obtained hot from the refinery, either through short haul, or by the use of insulated tank trucks or tank cars, in quantities permitting use of the latter. On larger projects, linings of sprayed type are now being constructed at costs of between $0.60 and $0.75 per square yard, which includes over-excavation and subgrade preparation, as well as asphalt application and covering. Perhaps even more important than the cost factor is the fact that this type of lining may be successfully constructed during severe winter conditions when nearly every other type of construction is impractical. In northern latitudes, this factor is of major importance since winter normally offers the only period available for construction work in operating canals and laterals.

PICTURED AT TOP OF PAGE—
A DRAGLINE places 12 to 18 in. of soil cover over lining which has been rolled into place on smooth subgrade. Weight of the cover helps to seal joints in lining.

The first installation

Early in the rapidly extending use of membrane linings of the sprayed type, it was found that projects involving use of small quantities of materials and labor unskilled in the handling of hot asphalt and asphalt distribution equipment presented special problems in securing the benefits of membrane type lining. At the same time, the need for such a type of lining, placeable at low cost, was obvious. To obtain full benefits from a low-cost lining in ordinary maintenance work, it was established that the lining desirably would be placeable with unskilled labor, without equipment other than means of transportation and simple tools, and be capable of convenient purchase and warehousing, available for immediate use when needed. The cost of such lining, to be practical, was indicated as limited to a maximum of be-



UNROLLING strips of the prefabricated membrane down the canal slope. The upper edges of lining in the foreground are held in place on the berm by wire pins.

POURING RC-O asphalt cement on lap area between strips. Workmen at top of bank are holding roll of lining which will be rolled down the slope and lapped over edge of sheet in place.

tween $0.25 and $0.50 a square yard, f.o.b. factory. These problems were attacked by the Bureau of Reclamation in its lower-cost canal lining program, and early in December 1949, the first prefabricated membrane canal lining meeting these requirements and made to Bureau specifications was turned out by the Lloyd A. Fry Roofing Co. at their San Leandro, Calif., plant. This lining was installed later in the same month in laterals of the Bureau's Klamath Project near Tule Lake, Calif. This article describes these installations.

Reducing costs

A difficult problem encountered in all previous attempts to manufacture a prefabricated canal lining at low cost was the cost of the reinforcing material necessary for the fabrication and handling of the lining material. Either mineral or vegetable fabrics or mats generally increased the costs of such linings beyond the point of economic practicability, and frequently added undesirable stiffness to the lining as well. In the Bureau lining development, a great reduction in cost as well as advantages of flexibility were obtained by the use, in lieu of a permanent type of reinforcing, of a temporary reinforcing designed to permit manufacture, shipping and placing of the lining, but which would disintegrate rapidly in contact with water or moist soil, leaving a membrane of asphalt which could then deform without restraint to the contours of the subgrade surface, minimizing the danger of rupture to the membrane during such conformance. As specified, by the Bureau, the prefabricated membrane lining consists of a layer of catalytically-blown asphalt of 40-60 penetration, 175-225 softening point, carried on a heavy Kraft paper of from "75" to "90"-lb. weight. The layer of asphalt has a specified minimum thickness of 0.17 in., uniform and free from holidays. The lining is fabricated on standard roofing manufacturing machines with minor changes in order to produce the thick coating required. The material is made up in rolls having widths of 36 in. and average lengths of 36 ft., the rolls weighing approximately 131 lb.

The installation on the Klamath Project was in the N-16 and N-17 laterals located approximately 11 mi. south of Tule Lake, Calif. Some 1,700 lin. ft. of 32 to 46-ft. perimeter laterals were prepared for lining. The laterals varied from 6 to 10-ft. bottoms with side slopes of 2:1 and approximately 7-ft. water depths. To allow for cover material, the laterals were first over-excavated to between 1 and 2 ft., and the excavated soil placed on the berm for use as cover after lining placement. The soil in the area is a typical lake sediment consisting of a mixture of diatomaceous earth, bentonite, pumice and organic matter, classified as an MH soil with extremely high shrinkage characteristics and low maximum density (53-lb. optimum dry weight).

Smooth subgrade required

The prefabricated type of lining requires a considerable smoother subgrade than is required for the sprayed type of lining, due to the fact that in the former the thickness of the lining imposes limitations on the deformation which may take place without danger of break-throughs of clods or rocks. The subgrade surfaces of the laterals were first dragged by heavy mats and moss chains to break up large clods and to fill cavities. The surface was then given a light dragging with a wooden drag to further smooth up the surface.

Placement of the initial portions of the lining was performed during ambient air temperatures of between 20 and 40 deg. F. The rolls of lining at these temperatures tended to crack when unrolled rapidly. To correct this action, the lining for each day's work was prewarmed by keeping the rolls on an elevated platform in a heated garage over night, the rolls reaching a temperature of approximately 50 deg. F. Maintained at this temperature by a tarp cover on the truck, the lining could be stacked on the berm, the rolls loosened by hand and then unrolled down the side slopes of the canal without injury.

Lining placed transversely

All lining was placed transversely in the canal. Initial experiments were with alternate strips placed with the paper side up, the others with the paper side down, in order to secure an asphalt-to-asphalt contact at joints. This method proved awkward, and the procedure was changed so that all lining was placed with the asphalt side up. This greatly increased the speed and convenience of laying. All joints were lapped 2 in. Before lapping, the edge of the previous sheet in place was coated with RC-O,* poured from an ordinary watering can to which a steel tube spout had been welded. The next sheet was then placed over the coated lap. Short wire pins cut

*Rapid-curing liquid asphalt, lowest viscosity.

from roll wire on the job and bent into an "L"-shape were used to temporarily hold the upper edge of the lining and joints in place until cover could be placed. Since the perimeter of the canal was in excess of the length of the lining in a roll, it was necessary to make a joint in each transverse strip. These joints were lapped 2 in. also, after coating with RC-O.

Placing earth cover

Earth cover was placed by dragline. It was found that certain precautions were necessary in this operation. When cover material was placed, progressing in the same direction as laying, some earth frequently entered into the joints, holding them open and providing foci for possible leakage. It was found necessary to cast the soil cover counter-directional to the direction of lining placement, giving the soil a rolling motion with the dragline. When this was done, the descending earth neatly folded down the edges of the lining, making a satisfactorily tight joint. The cover depth varied from 12 to 18 in. Examination of a number of joints several weeks after placing and covering indicated that a satisfactory joint was obtained by the methods used. The presence of paper in the joint is indicated as being of negligible consequence in affecting joint tightness due in part to the weight of the cover material over the joint, and in part to the saturating action of the low-viscosity RC-O used for the lap cement on the paper.

Wind destroys uncovered lining

A severe windstorm occurring one night and again at noon the next day gave unexpected data regarding the vulnerability of uncovered membrane to wind damage. Approximately 115 rolls of lining placed the day before, and remaining uncovered due to dragline breakdown, were almost completely destroyed by a high wind of gale force. The wind blew directly against the laps of the lining, raising the strips and rolling the lining out of the lateral. One small area which had been lightly covered with soil immediately after placing was not disturbed, indicating the protective character of the soil cover. The results of the storm indicated the advisability of covering the lining as soon as possible after placing.

APPEARANCE of a cemented joint two weeks after placing and being covered with earth. Saturating and cementing action of the RC-O (rapid-curing liquid asphalt) is continuing and a tight seal is being effected.

APPEARANCE of completed prefabricated lining installation with a 12- to 18-in. layer of cover material in place. This cover is not compacted when placed, but is consolidated by water action during use. Note snow, indicating cold conditions under which lining was placed.

Placing of the lining was accomplished by a normal crew of from six to eight men, with from 1,000 to 1,200 sq. yd. of lining placed during a 6-hr. actual work period. The cost of placing varied from 5.5 to 6.3 cents per square yard. The lining was purchased at a cost of $0.35 a square yard, f.o.b. San Leandro, Calif. The total cost of the installation, including subgrade preparation, material, labor and transportation, and covering was approximately $0.75 a square yard, with a cost of $0.70 a square yard or less possible under more favorable conditions. While this cost is higher than may normally be expected with a sprayed-type membrane, the cost is considerably less than could be obtained if cold, cartoned asphalt were used in small quantities.

Recommendations

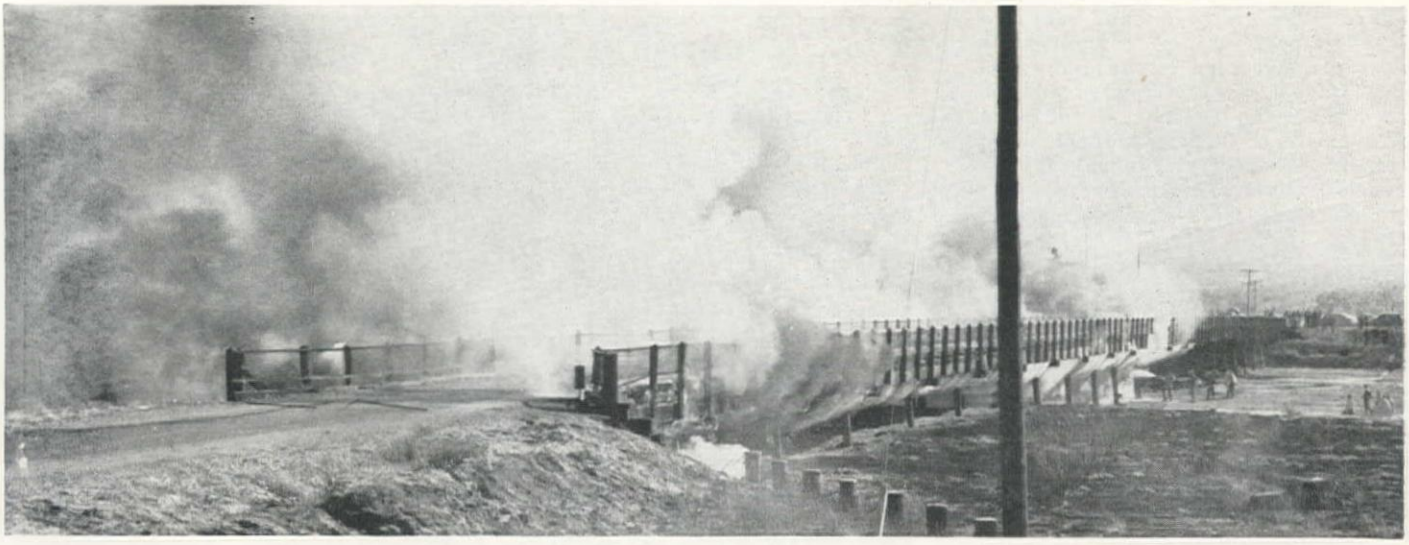
The primary purpose of the Klamath installation was to determine, in addition to costs, the problems encountered in the manufacture, shipping and placing of this type of lining. The data obtained from the installation to date indicate that the material may be manufactured and handled without difficulty, and may be placed under appreciably difficult conditions if proper precautions are taken in handling cold lining and in placing cover material. Protection against severe wind conditions is advisable, it being recommended that each day's placing be covered with at least a slight soil covering, if immediate complete covering is not possible. Tests on heating rolls in confined spaces also indicate the need of exercising caution in storing the material manufactured under existing specifications in air temperatures over approximately 115 deg. Some sticking of material in the rolls was encountered under these conditions. The manufacturers contemplate use of paper "floater" strips or asphalt of higher softening point to prevent future sticking from this cause. Rolls are advisedly stored on end rather than on the side in order to prevent undue flattening of the roll. Stored and shipped on end, the rolls resist injury remarkably well at all ordinary temperatures.

Availability of lining

At the date of this writing, several manufacturers are either producing this type of lining or have material under development with the expectation that this type of lining may be generally available to many areas in the Western States within a short time. The lining fulfills an urgent need for a low-cost prefabricated lining which may be used for small canals and laterals to control seepage, where use of the sprayed type of membrane may be impractical.

Personnel

The Klamath installation was made under the direction of E. L. Stephens, Project Manager, and C. O. Wamstad, Project Construction Engineer. George L. Browning, Engineer, supervised actual placing of the lining and development of placing methods. Equipment and labor personnel were under the direction of A. J. Lommasson and Mr. L. McAnulty of the Tule Lake Operation and Maintenance Office of the Bureau. The prefabricated lining was developed by the writer in the laboratories of the Bureau in Denver, which are under L. N. McClellan, Chief Engineer. The Lloyd A. Fry Roofing Co. and its representative, G. L. Oliensis, Head of Research and Development, contributed greatly to the successful installation through development of manufacturing methods for this type of lining.



New Mexico Speedily Repairs Burned Bridge on Rio Grande

By
T. H. CARD
District Engineer
New Mexico State
Highway Department
Deming, N. Mex.

Eighteen spans of the timber trestle bridge on U. S. 85 at the Texas-New Mexico border were rebuilt in three weeks after being destroyed by fire — Damaged piles were cut off and re-capped to support new bents

A TELEPHONE call was received last Dec. 27 at the District Highway Office in Deming, N. Mex., reporting to the office that the bridge across the Rio Grande, 3 mi. north of Hatch, N. Mex., on U. S. 85, was burning and that it looked as if the fire was out of control. The writer left immediately for Hatch with Frank G. Scott, Maintenance Superintendent. The fire had been burning about two hours and had destroyed eighteen spans. The fire department from Hatch had used its apparatus to extinguish the flames on six spans and was trying to confine the fire to twelve spans already too completely burned to salvage. The writer immediately went to Las Cruces to get some dynamite to try to save part of the bridge. By the time this arrived, a bulldozer had been found, which was used to bulldoze out one bent and drop the stringers into the streambed where they could be pushed to one side as a firebreak.

Bridge an important link

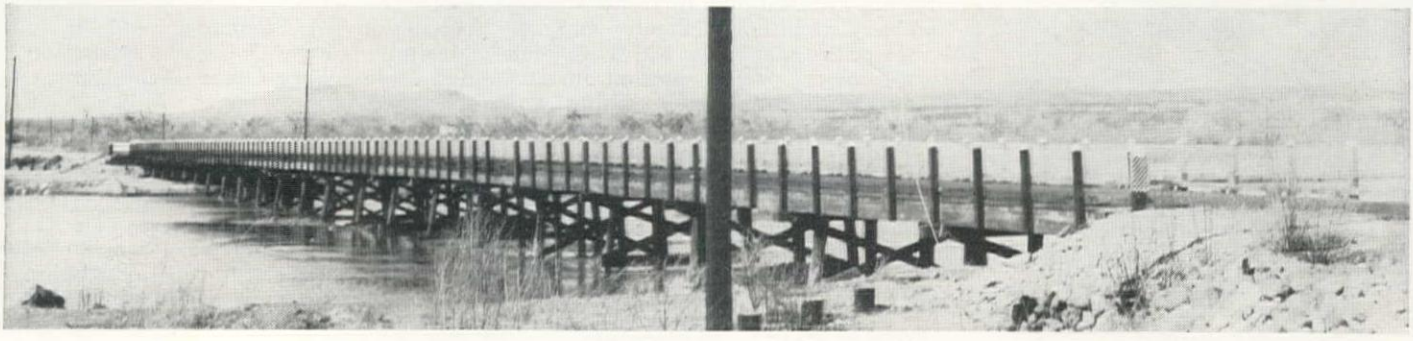
Closing of the bridge created a serious situation. U. S. 85 is the main North-South road between El Paso, Texas and Albuquerque, N. Mex., and carries much heavy traffic. In this region, the bridge is the only crossing of the Rio Grande for heavy trucks, although there is a county bridge one mile upstream. However, the county structure is a one-way bridge, which is not designed for extra-heavy loads. To bypass the burned structure, traffic could have gone west on U. S. 80 to Nutt, N. Mex., and then by dirt road over the mountain, finally driving back on U. S. 85 north of the bridge crossing. But grades over the mountain were too steep for this traffic. Instead, an old road was located which took off below Hatch and followed around the hills and came back at Salem, north of the burned bridge. This road was washed out in numerous places. An auto patrol was put to work on this road the same day as the fire and a bulldozer and a Tournadozer were ordered brought in. This road was opened to traffic two days after the fire.

The makeshift detour road was very narrow and the curves were too sharp for two-way traffic of large semi-trailer trucks, so a watchman was kept at each end of the detour. Another man with a pickup truck convoyed traffic each way. These crews were kept on duty during three 8-hr. shifts. The Tournadozer was kept working through all shifts to see that no one got stuck. A water truck wet the detour route continuously so that after a time the tracks became hard and dustless. A loader with two trucks hauled gravel to stabilize any spots which became soft. In this way all heavy trucks were able to get around the burned bridge until the rebuilt bridge was opened.

Salvaged repair materials

While the bridge was still burning, B. G. Dwyre, New Mexico State Highway Engineer, and Mr. Mayes, the State Maintenance Engineer, flew down in the highway department's airplane to inspect the damage. Orders were issued to E. B. Van de Greyn, the Bridge Engineer, to assemble lumber and replace the burned spans, using State forces. Inventories of the different Highway Districts showed that sufficient salvaged creosoted piles, caps and stringers were available for the job. An alfalfa field adjacent to the bridge was obtained for a

THE BRIDGE ABLAZE, top of page. A wind fanned the flames underneath making fire-fighting difficult. View below shows the bridge as it looks after the speedy three-week repair job.



landing field and Lee Campbell, Assistant Bridge Engineer, flew down to decide on the number of spans to be replaced. This field, incidentally, was used many times in the following three weeks. Campbell found that not only the twelve spans which were completely burned had to be replaced, but also the two spans which had been bulldozed out and the four spans which were partially burned. This made a total of eighteen spans.

Piles cut off and re-capped

It was decided to cut off the piles below the ground and cap them and frame a bent on this cap. Drift pins were driven into the caps and left sticking up. Holes were drilled into the piles to take the pins. After the bent was in place, creosoted timbers were nailed to the bottom caps between the piles and on the outside of the piles to hold them in place if driftwood should lodge against them.

On the day after the fire, transport trucks delivered timber from Deming, Roswell and Albuquerque. Hauling was continued until all the lumber was on the job. Inventories of the Highway Districts were checked and orders placed at once for the hardware which was not available in the highway stores. The Bridge Foremen of the Deming, Roswell and Santa Fe Districts were sent to help replace this bridge. A crew of men started cleaning up the site while the fire was still burning. It was on the second day after the fire that Lee Campbell arrived to supervise the work. He remained until the structure was rebuilt and opened to traffic. Jim White, an engineer for the Bridge Department, did the instrument work in connection with the rebuilding.

Repair of bents

On the third day after the fire, work was started on the rebuilding. Two truck cranes and a bulldozer had been sent to assist in the work. The bulldozer built a road parallel to the bridge and diverted the flow of water in the Rio Grande under the spans which were not damaged. One foreman with a crane removed the spans which were not completely burned. Another crew dug out the piles below ground so that the piles could be cut off and re-capped. As soon as a bent was framed and in place a crane would start to work on erecting of the stringers.

It was found, on digging out the bent which was bulldozed out during the fire, that the piles were broken off too far below ground to allow capping. This had been anticipated and pile-driving leads and a drop hammer had been delivered to the job. Four 45-ft. piles were driven for this bent. Although this operation slowed reconstruction somewhat, other operations were going on during this time.

Floor and abutment repair

As soon as the stringers were in place another crew started laying floor. Many of the salvaged stringers were found to be warped and had to be adzed to give good bearing for the flooring. Treated 4 x 4-in. flooring was used as far as the available supply lasted. Untreated 4 x 4-in. flooring was used to complete the job.

It was originally thought that piles would have to be driven in the abutment, but it was found that only the top 2 ft. of piles were burned. Two caps were used on these piles. Heavy creosoted timbers were bolted to the piles to help hold the caps in place.

Lee Campbell, Assistant Bridge Engineer, who supervised the three-week reconstruction of the bridge, died from a heart attack a few days later.

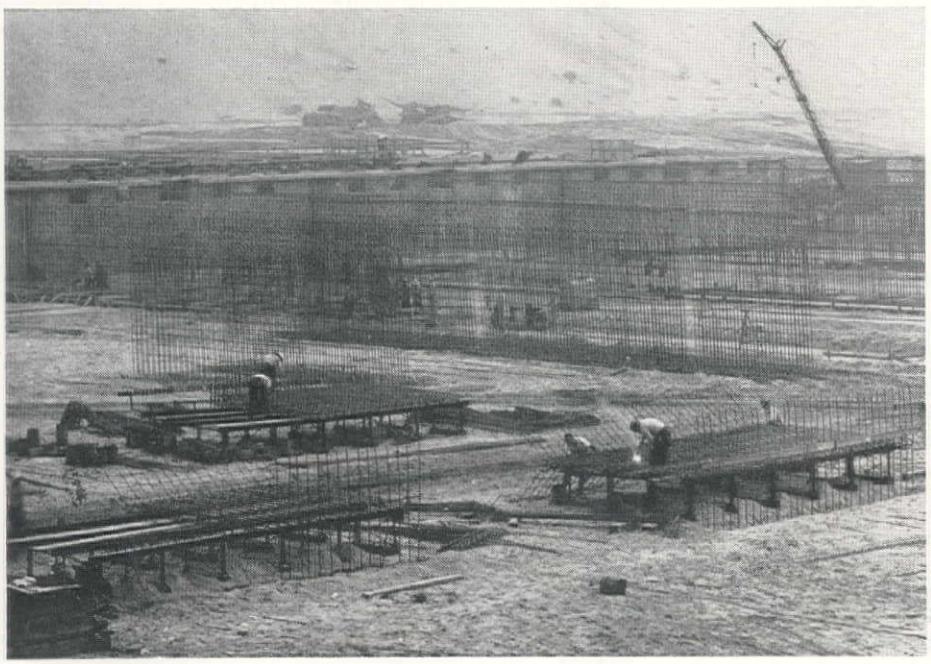
Jig Assembly Method Speeds Placement of Reinforcing Steel

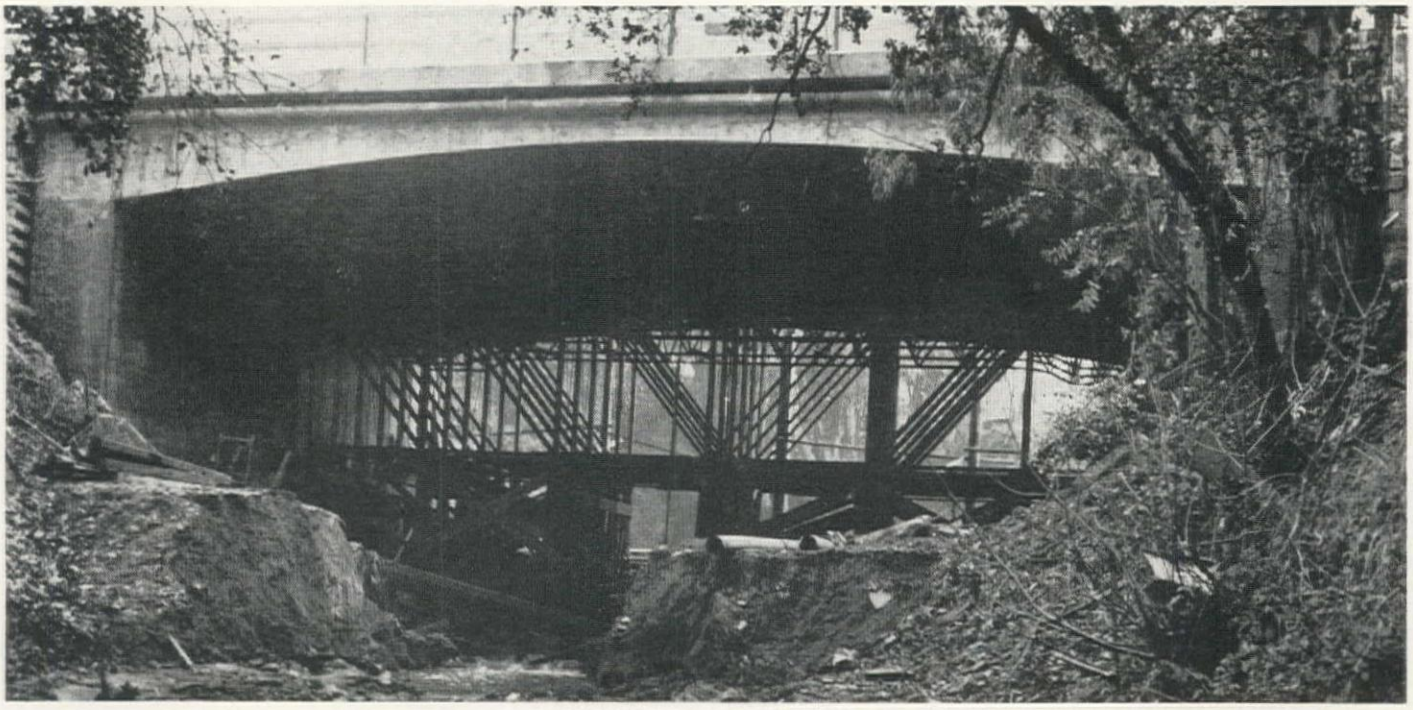
JIG ASSEMBLY of reinforcing steel is helping Rutherford & Skoubye of Oakland, Calif., to speed steel placement on construction of a portion of the Hyperion sewage disposal plant at El Segundo for the City of Los Angeles. The pre-assembly method used by the firm has the time-saving advantage of making it possible to place steel work in correctly spaced locations on a horizontal jig, circumventing the necessity for holding the reinforcing steel in place by attachment to the forms.

The method is being used for the units of the plant's aeration system. After assembly on the jigs, each unit of reinforcing steel, 30 ft. long and 18 ft. high, is lifted by a mobile crane from the jig and set on the footing forms, ready for the concrete to be placed. Much time is saved since the steel can be welded while lying flat; also, several segments can be worked on simultaneously.

According to Jack Shobe, superintendent for Rutherford & Skoubye on the job, the steel placement is speeded up about 50% by use of the jig method as compared to conventional methods. But, as he points out, the method is probably limited to jobs where at least 500 tons of reinforcing steel is to be placed and where the design of a large number of units is the same.

The general contract for the $6,000,000 construction of the aeration system is held by Peter Kiewit Sons' Co. and Fred J. Early, Jr., Co. in a joint venture. The general contractor placed contracts for furnishing the fabricated reinforcing steel with Bethlehem Pacific Coast Steel Corp., San Francisco, and the contract for placement was awarded to Rutherford & Skoubye.





Pre-use of Steel Building Truss and Re-use of Piling Makes—

Low-Cost Falsework for Arch Bridge

Falsework for a 70-ft. concrete arch bridge in San Leandro, Calif., was made up of materials obtained from many unusual sources

By
EDWARD LEIGH-KENDALL
Superintendent for Stanley W. Taylor, Contractor
San Francisco, Calif.

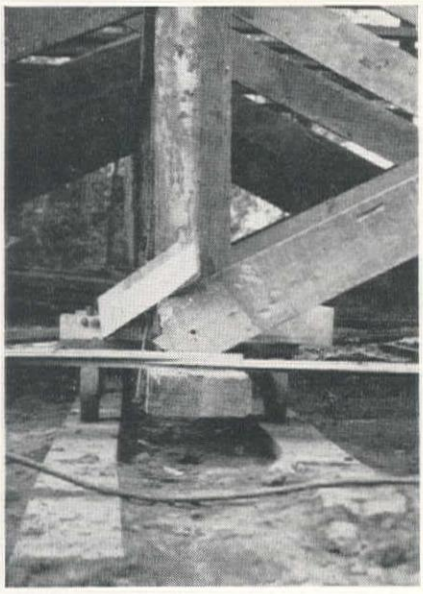
FACING a transportation problem typical of the West's expanding communities, San Leandro, Calif. (pop. 27,000) found it necessary to build a bigger bridge on one of the main boulevards, without rerouting local traffic. Stanley W. Taylor, San Francisco contractor, contended with strong peak-hour volumes of traffic and overflowing "sidewalk superintendents" from an adjacent high school as he built the $84,343 concrete bridge, in halves, within the crowded right-of-way of Bancroft Ave. and the steep banks of San Leandro Creek.

To handle flash flood water in the stream bed, as well as traffic volume, Charles P. Martin, Director of Public Works, decided upon a reinforced concrete bridge of the jack arch type, 70 ft. in width and with a clear span of 70 ft. Because of the confined space at the site, there were two alternative plans for handling traffic. (1) Traffic could be rerouted around several long blocks while the piles and deck of the old bridge were torn down and the new structure built; (2) the city could tear down half the old bridge, while maintaining traffic on the remaining section, until the first half of the concrete bridge was in place and ready to carry a live load. The latter system was used.

Construction planning of the job resulted in the use of planks from the old structure placed in falsework of the new. Many 6 x 16-in. floor joists were salvaged and used as mud sills beneath the arch form. The sills rested on a foundation of streambed clay, well graded. Sway-braced used piling, 9 ft. high, rested on the sills and supported the main falsework, which consisted of six steel trusses built up of 5 x 3½-in. welded angle sections to give a 70-ft. span. The trusses were topped with laminated 3 x 8-in. planks to form purlins, and these in turn were covered with lengths of 2 x 6's to give curvature. The contact surface of the form was ¾-in. plywood. In this case, the contractor wanted well seasoned material for making up the purlins, and thus used second-hand 3 x 16-in. floor joists that were sound and bright from an old furniture warehouse being wrecked in Oakland.

The unusual method of using steel

COMPLETED BRIDGE, below. Falsework in place under half of the bridge, top of page.



THE THREE elements of the falsework are shown above—steel trusses on a platform of used piling, which in turn was supported on heavy mud sills. Sills were lowered by undercutting and tracks and wheels (left) were inserted for removing the falsework.

trusses on platform piling for the falsework was justified by the fact that the trusses proper had been fabricated for use in the construction of an industrial building at a later date. Each truss was used in the exact shape in which it would be erected at the later date, except for box bracing with light gage steel on the upper chord.

The platform piling and series of six steel trusses were built exactly to fit the first half of the bridge, the plan being to shift all the falsework to the second half for the remainder of construction. This would be no problem at all to do on a simple arch, however the bridge had a crown to the top slab, in addition to a skew angle. This meant that the falsework had to be removed completely from under the arch, turned around, pulled alongside to the new site, and jacked to grade.

After curing the pour on the first half of the bridge, the piling platform, trusses, and formwork were lowered by hand excavation around the mud sill. The entire falsework structure was then moved upstream to a well graded spot. At this point, the unit was pulled around with a tractor and block and tackle guyed to nearby trees. Due to the fact that the day of the week was Friday, at the end of the shift it was decided to have a few of the crew report the following morning to turn the form around. Weather reports were for clear weather, and it looked like about a 4-hr. overtime job in order to wheel in high gear the following Monday. However, the best laid plans don't always click. During the night a water main burst, and the next morning the superintendent struggled with all the water from a 6-in. main that left the dry clay turntable a miry pond of mud. This incident delayed the second pour by about ten days, but following this the entire job proceeded smoothly.

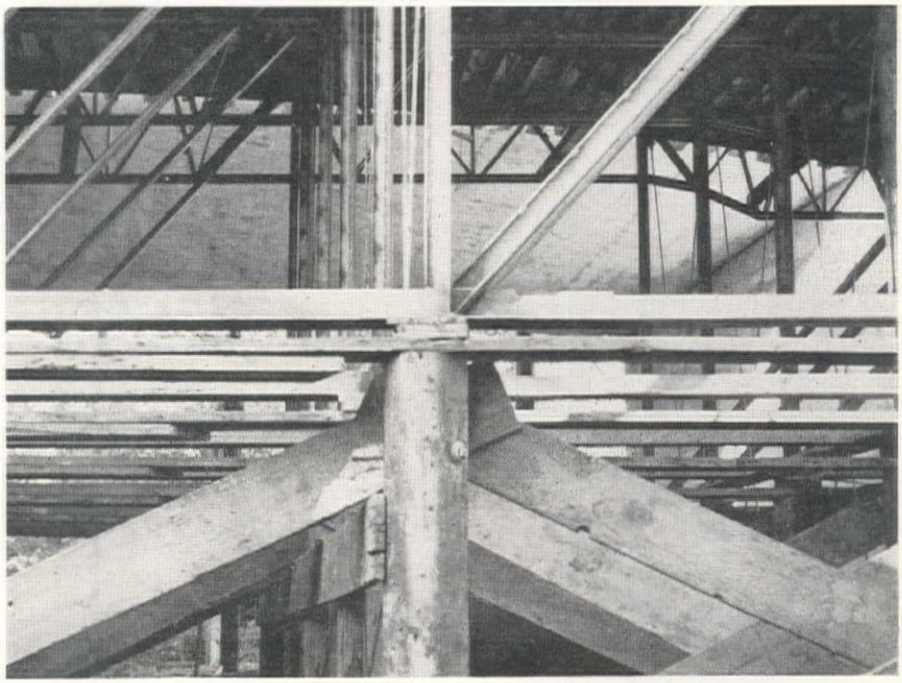
Once reversed, the falsework was wheeled in on the sills to its new site, and jacked up to the correct elevation. The entirely unique falsework conglomeration was designed and built with this plan in mind. There were 30 piles set to receive the trusses at pinpoints, and for the 12 spring ends the contractor used two 6 x 16-in. planks together.

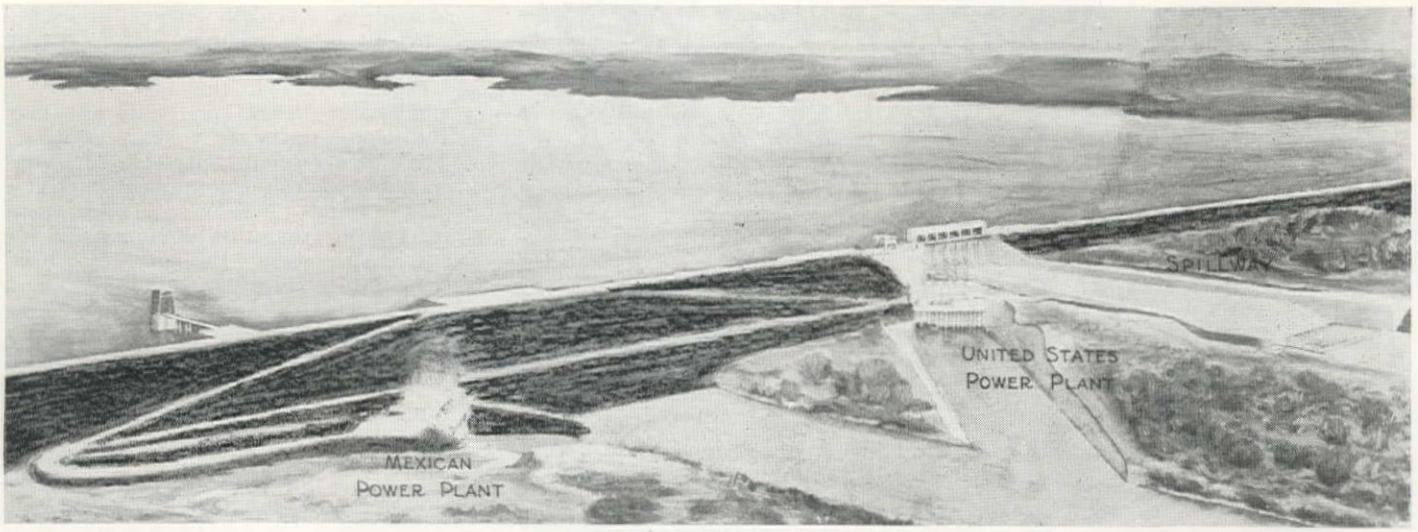
Abutment walls, 28 ft. high from footing to deck, varied in thickness from 3 ft. at the bottom to 6 ft. at the top. An ingenious method for tying abutment wall forms was used in this instance by the contractor. Instead of conventional tie rods, the contractor welded 6-in. cold rolled steel studs on the ends of the horizontal reinforcement. These rods were ½-in. diam., 2-ft. center-to-center spacing vertically and horizontally. The studs were threaded to she-bolts which projected through the plywood form, 2 x 4-in. studs, and 2 x 4-in. walers to a cathead nut and washer. In this manner the horizontal reinforcing steel served the dual purpose as both rod and tie bar.

Footings for the second half of the bridge were poured before the completion of the first half abutments and arch. The entire job was pushed as hard as possible, and by leaving the forms in place, traffic was diverted from the old structure to the first half of the new in ten days after the deck pour. The balance of the old wooden structure was demolished, and in its place the clay platform was graded in order to receive the falsework.

Personnel for the city include Charles P. Martin, Director of Public Works, and Jim Lanning, Inspector. Edward Leigh-Kendall was Superintendent and Lowell M. "Red" Todd was Foreman for Stanley W. Taylor, Contractor. The bridge was designed by James W. Trahern, Civil Engineer, Oakland.

HEAVY SWAY-BRACING on the platform and tie rods between the series of six steel trusses made adaptation of the trusses possible. A close-up of platform-truss connection, shown below.





U. S. and Mexico Will Divide Costs and Contract Work for a—

$46-Million Earth Dam on Rio Grande

Construction of Falcon Dam on the Texas-Mexico border will be a cooperative enterprise of the two countries—Bids will be invited during the next two months for the rolled-earthfill structure, which will be 5 mi. long

DETAILED plans and specifications are nearly completed and an invitation for bids will be issued within the next two months for construction of the $46,065,000 Falcon Dam and Power Plants on the Rio Grande, first of the large international storage dams and hydroelectric plants to be constructed as provided for by the Mexico-United States Water Treaty of 1944. Construction of the project will be a cooperative enterprise of the two countries under the supervision of the two Sections of the International Boundary and Water Commission. The two Commissioners are L. M. Lawson for the United States and David Herrera Jordan for Mexico.

The structure, to be built at the Falcon site about 75 mi. downstream from Laredo, Texas, and Nuevo Laredo, Tamaulipas, Mexico, will create a reservoir with a capacity of 4,085,000 ac. ft. and a surface area of 114,000 ac. Of the total maximum reservoir surface area, 55,000 ac. are in the United States and 59,000 ac. are in Mexico.

Treaty dictates completion date

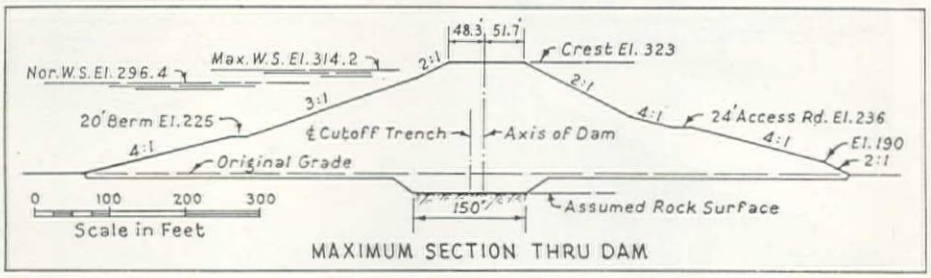
Of the 4,085,000 ac. ft. maximum capacity, 300,000 ac. ft. is initially reserved for dead storage for minimum power head and silt detention, 2,100,000 ac. ft. for conservation storage, and the remaining 1,685,000 ac. ft. for flood control and additional silt detention after upstream storage is provided. The conservation storage capacity is divided between the two countries on the basis of the capacity required by each for storage of water allocated to it by the Water Treaty—1,230,600 ac. ft. or 58.6% to the United States; and 869,400 ac. ft. or 41.4%, to Mexico. The regulated water supply to be provided by Falcon Dam is urgently required for the large areas of lands already developed in the Lower Rio Grande Valley of the United States, and for the development by Mexico of additional large areas on its side of the Valley. Because of this urgency the Water Treaty requires that the dam be completed by November 1953.

Joint construction and maintenance

Estimated cost of Falcon Dam and Power Plants is $46,065,000, exclusive of certain items to be borne separately by each Government within its own territory, such as costs of lands, construction camps, relocation of highways and utilities, access roads, administration, superintendence and engineering. The estimated cost of the dam without power plants is $33,407,000, prorated between the two countries in the proportion of the conservation storage capacity allocated to each, i.e., 58.6% to the United States and 41.4% to Mexico. The additional cost of the power plants is $12,658,000, to be borne equally by the two countries. The bases for division of costs of construction, as well as of joint operation and maintenance of the international storage dams and power plants, are established by the Water Treaty.

Two languages, two currencies

Plans for the dam and power plants were formally adopted by the Commission and submitted for the final approval of the two Governments on September 7, 1949. The Commission, consisting of the United States Section with headquarters in El Paso and the Mexican Section with headquarters in Ciudad Juarez, is the international agency charged by the two Governments with the application of the Water Treaty. The treaty, concluded in 1944 and effective November 8, 1945, settled the long-standing problem of the national ownership of waters of the international rivers and provided for the construction of international works for the conservation of waters of the Rio Grande and their utilization to the maximum benefit of the two countries. Briefly, the treaty provisions relating to the Rio Grande provide for conservation in international storage reservoirs, and equitable distribution between the two countries of the entire flow of the river below Fort Quitman, including an average of more than 3,000,000 ac. ft. which otherwise would



continue to waste annually into the Gulf of Mexico, largely in the form of floods.

Construction costs of the project will be divided between the two countries in accordance with the treaty provisions, by allocating to the two Sections of the Commission the performance of the various items of work on the basis of the estimated costs and in the proportions stipulated by the treaty. The work allocated to each Section is to be performed by contract, under the supervision of the two Sections. Specifications will be agreed upon and issued by the Commission in both Spanish and English, including identical technical provisions approved by the Commission, and legal provisions prepared by each Section in accordance with the laws of its own country. Separate bids will be requested on the schedule of work allotted to each Section, in dollars for the work allotted to the United States Section and in pesos for the work allotted to Mexico.

Planning

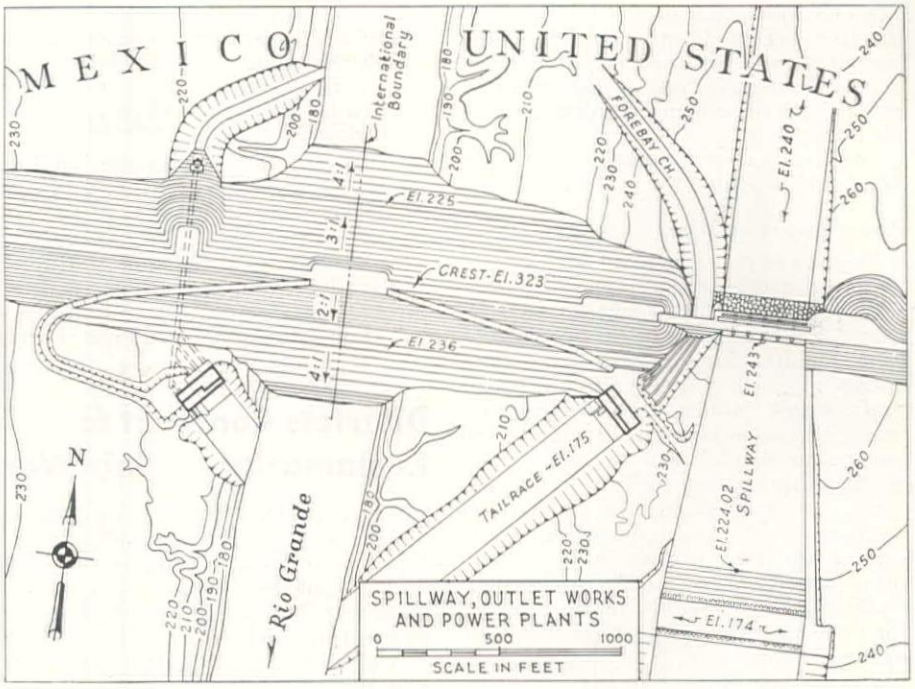
Subsequent to the signing of the treaty, the two Sections of the Commission have carried on intensified studies to determine definitely the conservation requirements under the formulas established by the treaty and the requirements for flood control and silt detention, and to complete the necessary technical data for the planning of the works. Because of the urgency of the lowest international storage dam, the Commission's efforts since the treaty became effective have been largely concentrated on developing plans for that dam.

In the development of plans for Falcon Dam and Power Plants both Sections of the Commission have consulted freely with the interested agencies of their respective Governments, particularly with the Bureau of Reclamation and the Corps of Engineers of the United States and the Ministry of Hydraulic Resources of Mexico, as well as with some of the outstanding engineering consultants of both countries. The Bureau of Reclamation is performing the design work on behalf of and under the supervision of the two Sections. A working model has been prepared at the Denver headquarters of the Bureau of Reclamation.

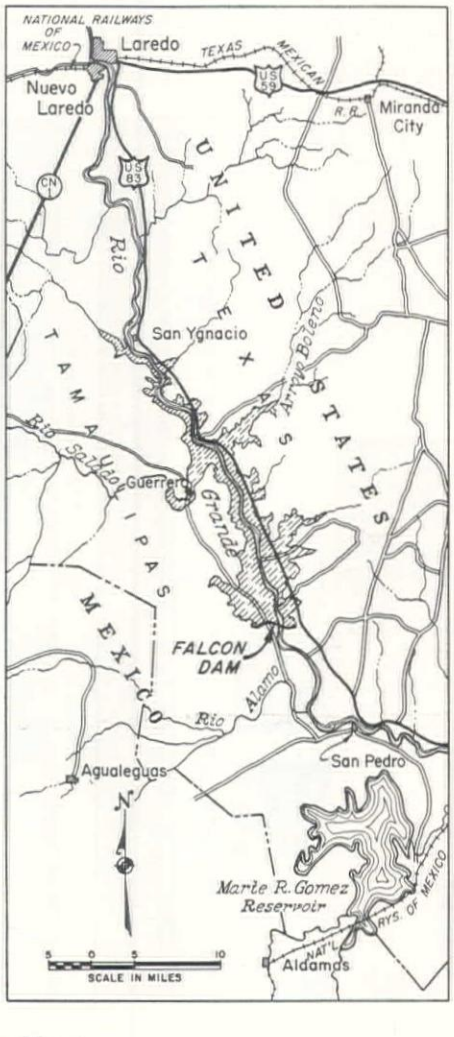
Design

The dam is of rolled earth fill construction with a total axial length of 26,294 ft., of which 10,133 ft. is in the United States and 16,161 ft. in Mexico. The crest of the dam, at Elev. 323.0 ft., is 35 ft. wide and the maximum height, above present river bottom, is about 150 ft. The upstream slope is 3:1 with a 20-ft. berm in the river section at Elev. 225, and thence a 4:1 slope to the original surface. The downstream slope is 2:1 to Elev. 250 and thence 4:1 to Elev. 190 where the slope breaks to 2:1 to the original ground surface. In the maximum section the distance between the upstream and downstream toes of the dam is approximately 1,000 ft.

An oil-surfaced roadway and sidewalk will be constructed along the entire length of the dam and a beam-type guardrail will be installed along both edges of the crest for protection of traffic.



The spillway is located through the left abutment about 1,400 ft. from the left bank of the river. It is a reinforced concrete structure of conventional design controlled by six 50- by 50-ft. fixed wheel gates. The gate sills are at Elev. 256.7 ft. The maximum design capacity of the spillway is 456,000 sec. ft. when the reservoir water surface elevation is at 314.2 ft. The flood storage capacity in the reservoir is sufficient to limit the discharge of all floods which have occurred during the past 50 years to a maximum discharge through the spillway of 60,000 sec. ft., and the additional capacity provided in the spillway will pass a "super flood" nearly three times larger than has ever occurred during the period in which records are available, without causing failure of the dam.



Outlet works in both countries

Separate outlet works are provided for each country. The United States outlet works consist of a concrete gravity dam section adjacent to the spillway in which are embedded three 13-ft. penstocks through which water is admitted to the turbines or by-passed to the river channel below. The upper end of the penstocks is protected by a trashrack structure and admittance of water to the penstocks is controlled by fixed-wheel gates. In the lower end water passing through the penstocks is admitted to the turbines through 84-in. balanced valves or by-passed to the river. The required capacity of the outlet works of 4,500 sec. ft. at reservoir water surface elevation 248.0 ft. is obtained by water passing through two of the three power turbines combined with the water passing through the by-pass line.

The Mexican outlet works consist of a 22-ft. diameter penstock whose upper end is located in a conventional-type tower structure. Water is admitted to the single penstock through a single fixed-wheel gate. At the lower end the single penstock terminates in a manifold section with the water passing first through 168-in. and secondly through 108-in. butterfly valves to the turbines and by-pass line to the river. The outlet works are designed to provide a capacity of 3,531 sec. ft. at reservoir water sur-

face elevation 255.9 ft. and 6,357 sec. ft. at water surface elevation 265.7 ft. These discharges are obtained by a combination of discharges passing through two turbines combined with the discharge of the outlet valves.

Additional outlet capacity for either country is provided for in the spillway.

Power plants identical

The power plants, one on each side of the river, are near the downstream toe of the dam and are identical in size, space, generating and service equipment, facilities for servicing, and ease of operation. Each contains three vertical-shaft, single-runner, Francis-type turbines, each of which will develop 14,750 hp. at a rated head of 100 ft., and a speed of 163.6 rpm., and three 3-phase, 60-cycle, vertical waterwheel generators rated on 10,500 kw., 6,900 volts. While each plant has a centralized control room and separate and independent facilities, the two will be interconnected for transfer of electric energy from one to the other.

It is estimated that the Falcon Power Plants will generate annually about 200,000,000 kw.-hr. of prime energy and 50,000,000 kw.-hr. of secondary energy. Under the Water Treaty this energy will be divided equally between the two countries.

Estimated major construction items for the dam and power plants include 29,415,000 cu. yd. of earthwork, 296,550 cu. yd. of concrete, more than 10 mi. each of tile drains, drill and grout holes, and road guardrails, 15,000 tons of reinforcing steel, and 7,500 tons of gates, valves, penstocks and other metal works.

Districts Contract for Reclamation Repair Work

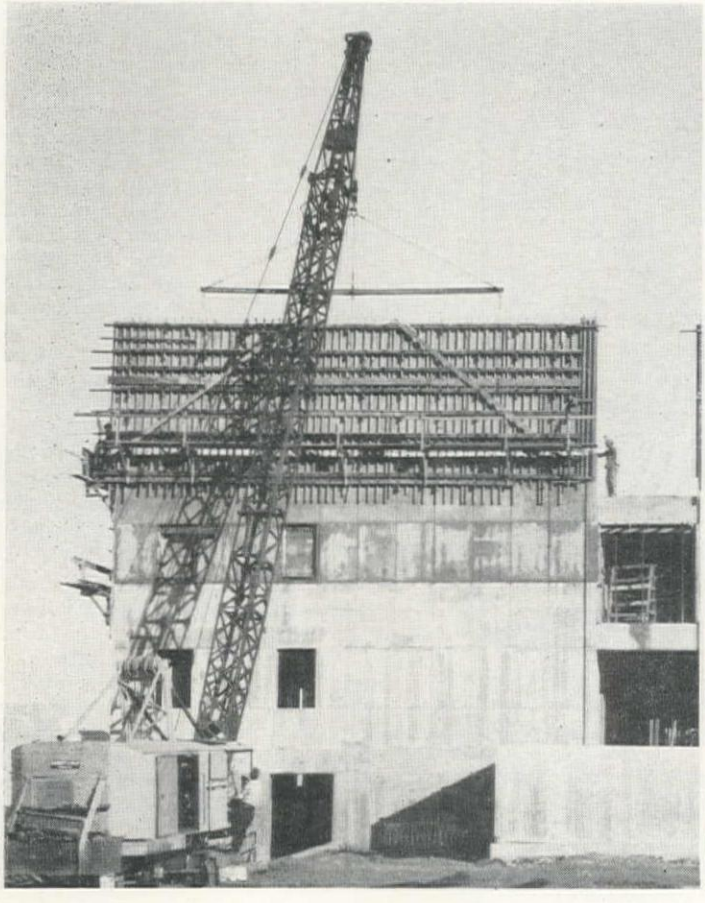
EXECUTION of repayment contracts, which will permit rehabilitation and betterment work to start on three Federal Reclamation projects within a few weeks, has been announced by Secretary of the Interior Oscar L. Chapman. Approval of a fourth contract is pending and the total of work involved on all four projects is estimated to cost about $13,500,000.

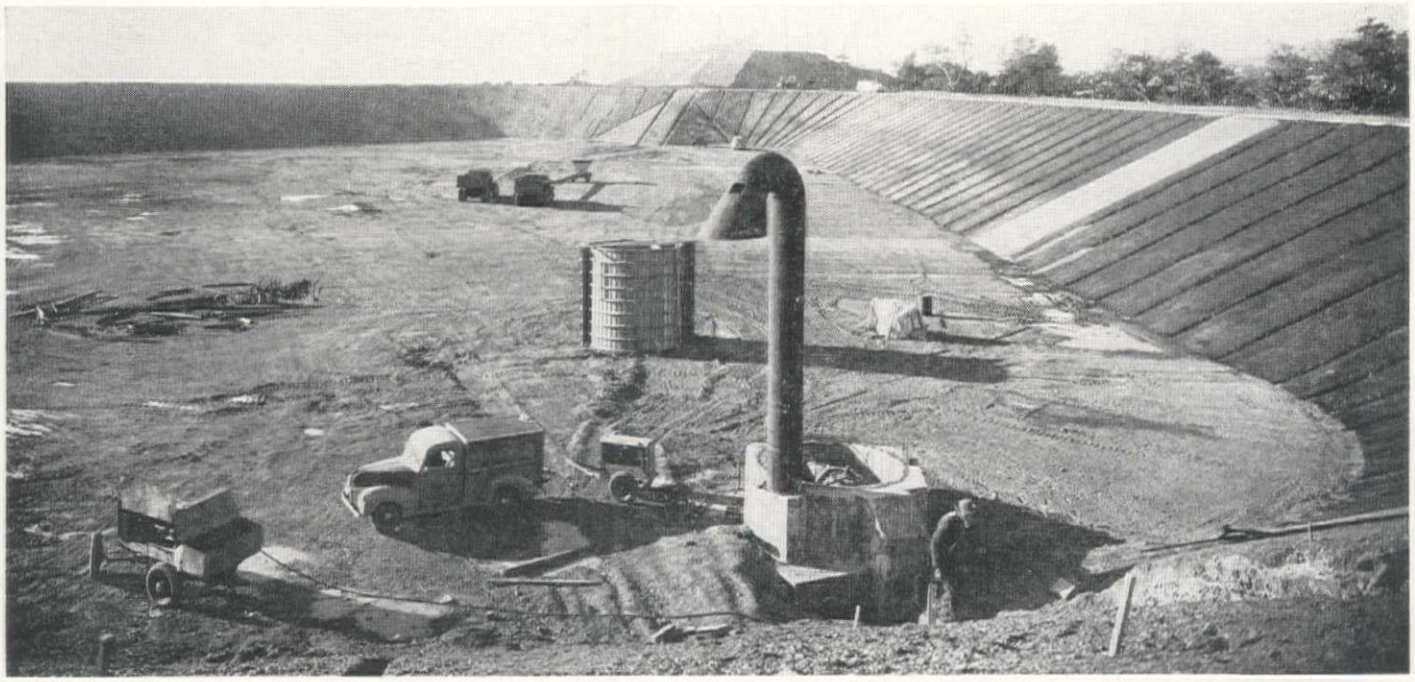
Legislation enabling the Bureau of Reclamation to undertake rehabilitation and betterment work, after the basis for the repayment contracts has been approved by the appropriate Congressional committees, was passed at the first session of the 81st Congress, and recently amended to expedite clearance by the committee.

Repayment contracts approved by Secretary Chapman include the following: Goshen Irrigation District and Gering and Ft. Laramie Irrigation District on the North Platte Project in Wyoming and Nebraska, $7,905,300; Grand Valley Water Users Association, Grand Valley Project, Colorado, $1,450,000; Midvale Irrigation District, Riverton Project, Wyoming, $1,800,000. In addition a repayment contract with the Salt River Valley Water Users Association for $2,306,881 rehabilitation and betterment work on the Salt River Project in Arizona has been approved and is awaiting execution by the water users association.

Huge Form Panel and Adjustable Steel Shores Speed Building

FOR CONSTRUCTION of the $1,300,000 Gleeson Memorial Library for the University of San Francisco, Barrett & Hilp, San Francisco, built the huge form panel shown at left below. Original intention was to use the form for the ground floor, but with the use of a crane the form was also used on each succeeding floor of the 4-story building. To enable the form to be lifted, a 30-ft. spreader bar was rigged with a 3-point sling. The panel itself is 16 by 60 ft., is faced with ⅝-in. plywood backed by 2 x 4-in. studs on 9-in. centers and purlins on 2-ft. centers. A Brown hoist-crane with an 80-ft. boom did the lifting. The panel was secured for each pour with ¼-in. cables guyed to inserts and turnbuckles. Deck forms for the concrete pours were supported by 1,500 adjustable steel Acrow shores, shown in place at right below. The shores were arranged in tight groups between the deck and forms without the use of sills or caps. The shores are re-used on subsequent floors of the building, and required no cross-bracing. Stanley Brown is superintendent and Clovis Staggers is general foreman for Barrett & Hilp on the job. Construction is scheduled for completion by August of 1950.





Long-Range Planning of Excavation Procedures Results in a—

Low Unit Cost for Lined Reservoir

Reservoir with multi-layered impervious lining at Oakland, Calif., costs $10,000 per million gallons of capacity — Contractor devises special equipment for work on slope

SENECA RESERVOIR, third largest in the distribution system of the East Bay Municipal Utility District, Oakland, Calif., is now under construction at a cost of $10,000 per million gallons of capacity. The $298,387 contract was let to Erickson-Phillips & Weisberg, of Oakland, on Sept. 7, 1949, including the placing and compaction of a multi-layered and impervious membrane lining. Completion date for the 30-m.g. distribution reservoir is May 1, 1950.

The low cost of the reservoir with its complex lining results from some preliminary excavation carried out during the war, when fill material was desperately needed for revetments on the Oakland Army Base. The base was being built mainly on reclaimed land at the San Francisco Bay shoreline, and fill material was given high priority. Fill was hauled on 24-hr. schedules from the nearest available areas and the top of the hill at the end of Seneca Street was sliced off and hauled as a part of this war effort.

Long range planning of the Utility District paid dividends, for in this instance the wartime contractor left the borrow pit to within a foot of grade for the Seneca reservoir bowl. Under the present contract, as well, the earthmovers obtained over 23,000 cu. yd. valuable fill material from the fine grading on the job.

The reservoir is located on a ridge in the foothills of East Oakland, on a site long reserved for a storage basin to serve the fast growing sections of the Utility District in the San Leandro and East Oakland areas.

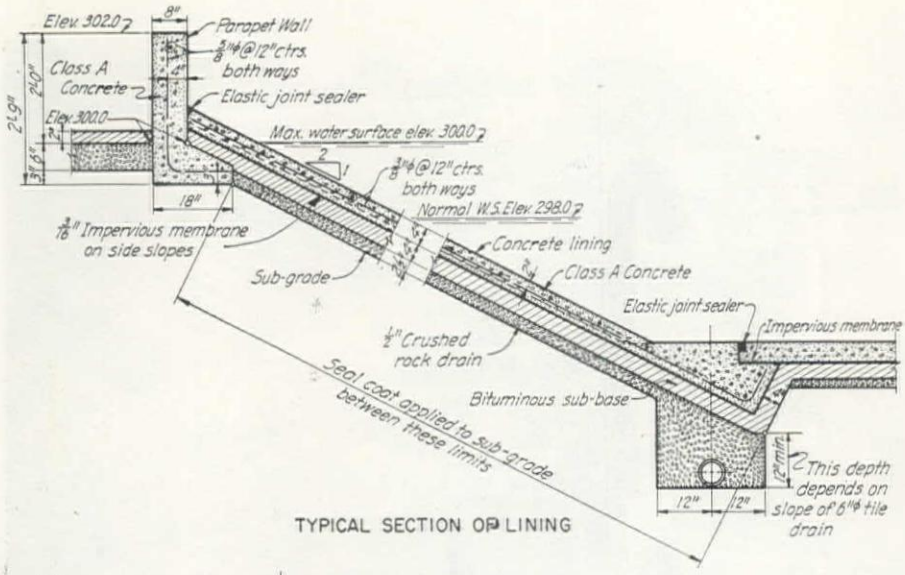
Impervious, quick-drain lining

Design engineers have puzzled over the problem of really impervious linings for decades. Lacking the solution for a "bottle-tight," economical construction, they have in many instances elected to accept drainage, but reduce uncontrolled water to zero. By having absolute control over leakage, designers can build an effective equal of the waterproof reservoir. This was done in one manner at the Baldwin Hills Reservoir in Los Angeles (*Western Construction News*, February, 1950, p. 61), and is being accomplished by a different method at Seneca.

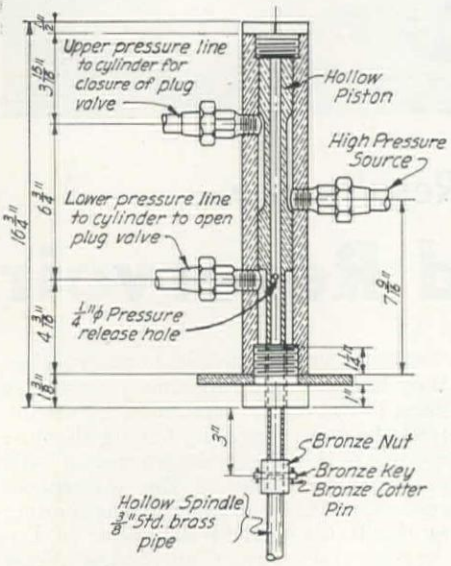
Design features

Lining on the 2:1 slope at Seneca begins with the rolled and stabilized subgrade. The subgrade consists of dry, porous earth, with a small outcrop of rock at one end. When sprayed with

KEY PERSONNEL on the job, left to right, are—RICHARD ADAMS, resident engineer, and J. W. TRAHERN, supervising civil engineer in charge of design for the East Bay Municipal Utility District, and ROSCOE W. PHILLIPS, superintendent for Erickson-Phillips & Weisberg.

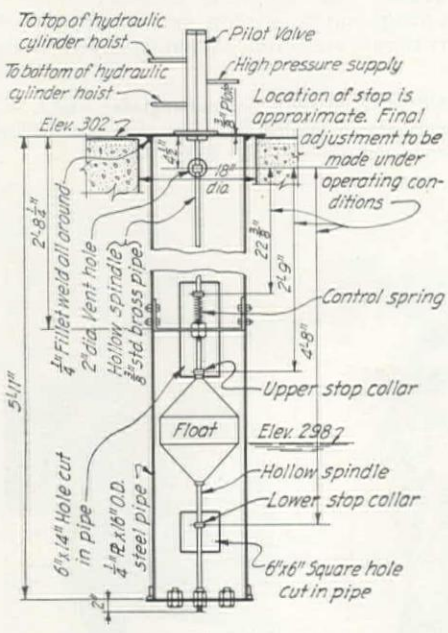


TYPICAL SECTION OF LINING



PILOT VALVE

PILOT VALVE depicted in drawings above and below was developed in the EBMUD designing engineer's office and has found acceptance with the organization because of its simplicity and accurate control. See text for complete description.



PILOT VALVE AND FLOAT ASSEMBLY

water, this material acts much like a blotter, absorbing the water before it collects as runoff. About 12,000 sq. yd. of this earth was seal-coated on the slope. Directly on top of the subgrade, a 2½-in. layer of ½ to ¼-in. crushed rock lining was placed to act as the drain. Crushed rock of this size was found to have the best stability and natural angle of incline during the construction of the slope. A 4-in. layer of bituminous sub-base is placed on top of the rock blanket. Over 1,900 tons of this quarry run material, similar to quarry waste, was pugmill-mixed with lime and asphalt emulsion. The sub-base was then given a prime coat of diluted emulsion in preparation for the membrane.

Directly over the sub-base, the impervious membrane proper is placed. In this case, it is a 3/16-in. layer of Laykold Weathercoat, an asbestos-fibre-bound asphalt emulsion, built up to specified thickness by spraying. Top layer of the reservoir lining is a 4-in. slab of Class A concrete, reinforced with ⅜-in. bars on 1-ft. centers.

The multi-layered lining for the floor differs slightly. A heavier, ¼-in. membrane is used between sub-base and concrete, and there is no reinforcing steel in the floor slab. Reinforcing steel was provided in the slopes for the purpose of preventing downhill creep, characteristic of inclined concrete slabs exposed to normal temperature expansion and contraction.

All drainage water is collected by a 6-in. tile drain and gravel trench around the perimeter of the reservoir floor. An additional tile drain and trench lies in the center of the reservoir floor, and collects all water from that area. Outside the reservoir, the drainage water is collected in a sump, where it flows over a weir for measurement. At the sump, it can either be discharged downstream as waste, or collected and pumped back into the structure.

A V-cut down to floor elevation of the reservoir was made at one end to accommodate the inlet and overflow pipe. A 6-ft. concrete cutoff wall was sunk into the soft rock, and the pipe is backfilled with select borrow. Better than 90% compaction is being obtained by a tractor-mounted double-acting compressed air tamper, developed by O. A. Fogelberg, Lafayette contractor. The rig is ideal for the close-quarter tamping around the cutoff wall, and up the inclined face of the cut. An outcrop of soft rock is located at this part of the job, and the V-cut was made directly over a pronounced fault. Oddly enough, the rock is white on the one side of the fault, and red on the other. Neither the fault nor the character of the rock necessitated any change in design of the structure.

Gin pole gear

For efficient construction of the multi-layered reservoir lining, the contractor has developed a special rubber-tired compactor, two bottom dump buckets, and steel drum roller. All four pieces of gear are designed to operate from the bottom perimeter of the bowl-shaped reservoir, and eliminate the need for operating heavy equipment on the slope during the latter stages of construction. The 6-ton drum roller is mounted on the end of a 65-ft. pylon (see illustration), built up of three lengths of steel tubing, boxed with light-gage steel angles, and acting as a long push boom. At the other end, the boom is pin-connected to the front of a 6-ton truck. To roll the subgrade and stabilized base material on the slope, the truck begins pushing the roller at the toe. When the truck has reached the toe of slope, the roller has completed one pass to the top. Overlapping passes compact the subgrade as the truck backs and pushes the roller up and down the slope.

The pneumatic-tired compactor, with heavily cambered wheels, operates in the same manner. A 65-ft. gin pole replaces the steel boom, since no width is needed, at the business end, to act as an axle yoke.

One of the bottom-dump buckets is designed to operate in the same manner as the above equipment, and will be used to place the 1½-in. slump concrete mix on the slope. The frame mounting for the bucket is supported by two truck wheels at either end. The frame acts as a craneway, allowing an additional side movement of the bucket during pouring operations. The other bottom-dump bucket is rigidly mounted on the end of

Equipment at Seneca

Model E Quick-Way truck crane
No. 12 Caterpillar motor grader
12-ton Huber roller
D-4 Caterpillar front end loader
D-6 and D-8 Caterpillar tractors
Model 27E Ransome paver
Model 25 Northwest shovel
White truck crane
200-amp. Lincoln welder
RD4 Allis-Chalmers tractor
Fruehauf low-bed trailer and dolly
Timpke 2-wheel trailer
Austin-Western 99 motor grader

Equipment engineered on the job—

6-ton drum roller, pole mounted
Rock spreader dolly, pole mounted
Vibrating screed
Concrete finishing machine
Concrete spreader

A TRACTOR-MOUNTED compressed air tamper was developed for close-quarter tamping around the cutoff wall and up a V-cut on the slope.

a gin pole, and is used to place the 2½-in. layer of gravel blanket.

Control of flow

The average reservoir bottom is at elev. 274. Normal water surface is at elev. 298, and the maximum water surface is at elev. 300. The normal flow into and out of the reservoir will average between 20 and 30 m.g.d. The maximum rate of inflow expected is approximately 75 m.g.d.

Flow into and out of the reservoir is controlled by a combination 30-in. hydraulically operated plug valve and 30-in. check valve. There are two 24 by 24-in. sluice gates in the wall of the 10-ft. diameter by 30-ft. high inlet-outlet tower. During normal operations all the above valves will operate under submerged conditions.

All valves except the check valve are controlled from the tower deck at elev. 302. In case the plug valve controls should mal-function, a 30-in. diameter siphon overflow is provided to prevent over-topping of the reservoir. The siphon overflow will discharge the maximum rate of flow expected and will maintain the reservoir water surface below elev. 300. The overflow parallels the 36-in. inlet-outlet line and discharges into a small creek about 400 ft. from the reservoir.

Hydraulic plug valve

The plug valve is operated from the tower deck by a hydraulic cylinder, which rotates a hollow stem by means of a rack and pinion gear. The valve is lubricated from the tower deck by forcing lubricant down through the hollow valve stem. The valve stem is enclosed by an additional pipe housing which protects the valve stem and supports the hydraulic cylinder and gearing on the

Concluded on page 93

A SPECIAL push boom handles a 6-ton roller on the sub-base of the slopes. A front-end drive truck was found to have ample speed and control to handle the roller.

PNEUMATIC-TIRED compactor with heavily cambered wheels and equipped with a 65-ft. gin pole was devised by the contractor for 2:1 slope work on the job. Compartment contains weights.

AN AUSTIN-WESTERN 99 motor grader was used to trim 2:1 slope sub-base. Supporting line from tractor on slope berm helped to insure accurate blade work.

A BOTTOM-DUMP bucket for low-slump concrete was mounted on a frame with a gin pole for placing concrete on the slopes. Frame acts as a craneway, allowing side movement.

War-Surplus Steel Material Builds a Suspension Bridge

By
CHESTER B. DUDLEY
Monterey County Surveyor and Assistant Road Commissioner
Salinas, Calif.

WESTERN COUNTIES are familiar with the fact that many times an engineer is faced with the problem of cutting the job cost to fit the budget. Monterey County, Calif. recently solved this problem in constructing a 386-ft. suspension span across the Pajaro River, west of Watsonville. The bridge was built by county crews to carry the Pajaro County Sanitation District sewer pipe and pedestrians across the river between their screening plant and the Watsonville outfall line.

Almost all war surplus used

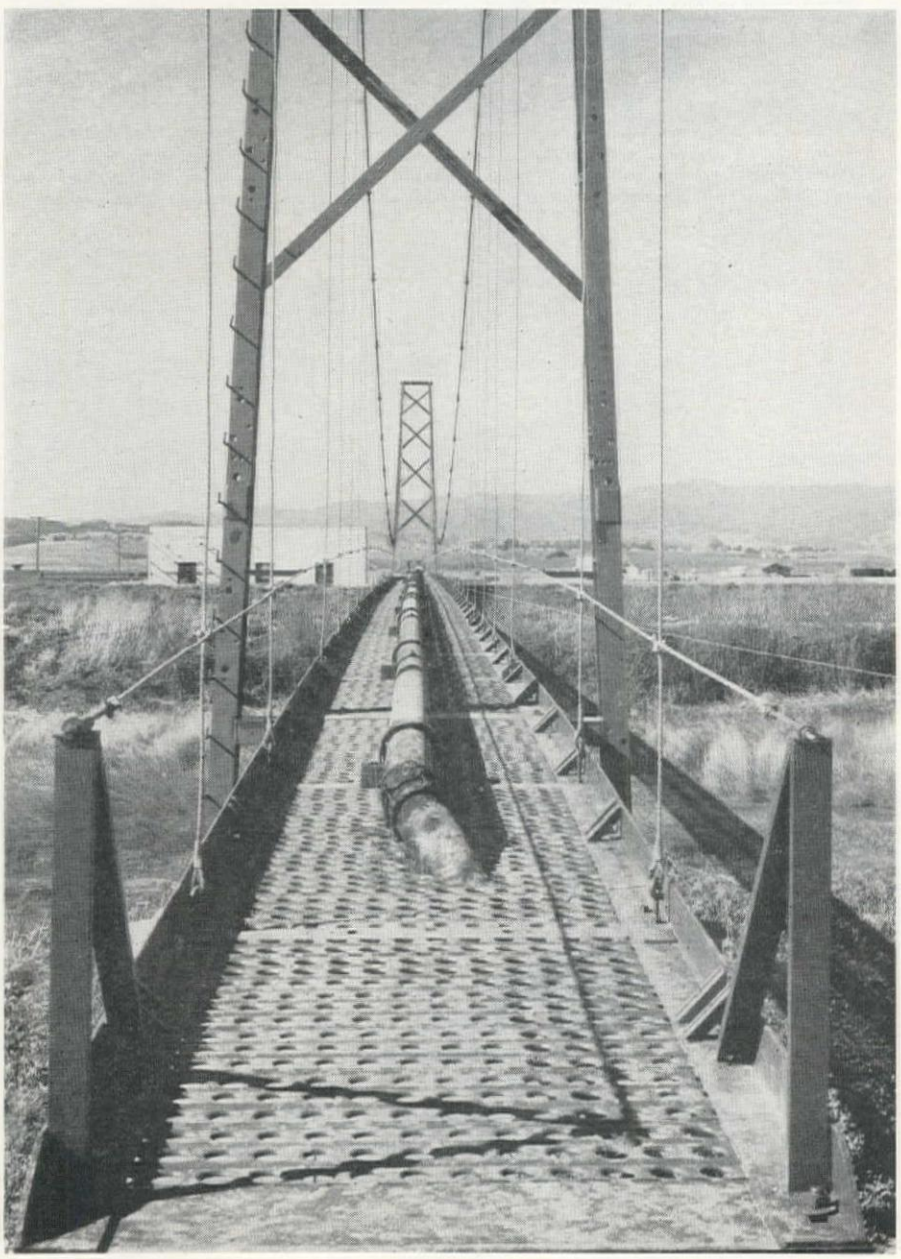
The thought-provoking feature of the suspension bridge is the quantity of war-surplus steel it contains. All materials used in the bridge's construction were taken from the material on hand, and the principal items are from war-surplus purchase.

The clear width of the deck is 4 ft., 8 in. Decking for the light weight structure consists of interlocking pierced steel planking, originally fabricated for the Navy as pavement for airplane landing strips. Planking was cut to length and welded to the underside of angle sections which serve as stiffeners. The angles are 6 x 6 x ½-in. surplus, fabricated for navy pontoons. Angle floor beams, 6 x 6 in., connect cable hangers and stiffeners at 10-ft. intervals. With the exception of erection bolts in the angle splices, all the structural elements of the bridge were fabricated by arc welding. Planking was welded to the under-side of the runners to provide a smooth walkway. All fabrication, with the exception of stiffener angle splices was done in the shop, making down-hand welding possible throughout.

The main cables are one-inch smooth-lay high-strength wire ropes, destined originally for Navy submarine and torpedo nets. Cables are anchored to concrete sections through turnbuckles and surplus eyebars.

FRONT COVER shows planking section being swung into place for deck.

THE BRIDGE was built to carry a sewer main as well as pedestrian traffic.



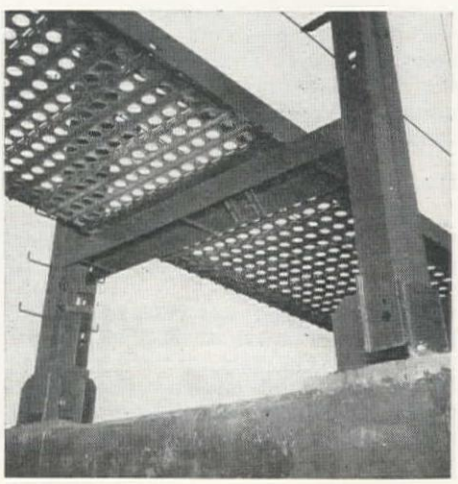
The towers are pin-connected at the bottom, and are fabricated principally from surplus 6 x 6-in. angles. Double 6 x 6-in. angles welded in a Z-shape were driven for piles. These are connected at the top by a concrete web-wall which supports the towers. Simple concrete abutments with slotted steel bearing plates support the ends of the walkway and provide for expansion.

The bridge supports an 8-in. steel force main, asphalt dipped and wrapped. Dresser couplings provide for flexibility and expansion. The pipe is supported by wooden cradles lined with expansion felt at 20-ft. intervals.

Personnel

The novel suspension bridge was built for the Pajaro County Sanitation District by the Monterey County Highway Department. Howard F. Cozzens is Monterey County Road Commissioner. Chester Dudley, County Surveyor and Assistant Road Commissioner, supervised design and construction of the bridge.

TOWERS, fabricated principally from 6 x 6-in. angles, are pin-connected at bottom.



Batter Piling Driven to 90-Ft. Penetration in a Deep Clay Bed

By CHARLES HAGEMAN*
Oakland, Calif.

THE DIFFICULT job of driving batter piling to 90-ft. penetration at a location on a deep clay bed was accomplished by Barrett & Hilp, San Francisco, for construction of guy anchors for a radio tower foundation at Belmont, Calif. A crawler crane, with an 85-ft. boom fitted with light 32-ft. swing leads and a 4,000-lb. drop hammer, teamed with a tractor to position the piles and drive them on 3 in 12 batter.

Site of the foundation is a diked area on the west shore of San Francisco Bay where the ground formation is a blue clay of great depth. A 550-ft. tall antenna tower for Station KNBC of San Francisco was designed to rest on a central footing which was to be founded on twelve piling extending 90 ft. under the cutoff. Three guy cables tied to anchors, spaced 120 deg. apart and 400 ft. from the tower, support the tower. Each of the guy anchors required eight batter piling, also 90 ft. under cutoff.

Driving the batter piling, which was done under the direction of the writer, was not an ordinary task. To drive plumb piles to 90-ft. penetration or more is not uncommon, but to put batter piles 90 ft. into the ground is quite a different task. In the San Francisco area, there are at least two 100-ft. standard skid drivers, but to drive the 90-ft. batter piling with such a rig, swinging leads at least 100 ft. would be necessary. Considering the cost of this extra rigging together with the many and long moves of the rig to the four anchor locations, it looked like a crane job.

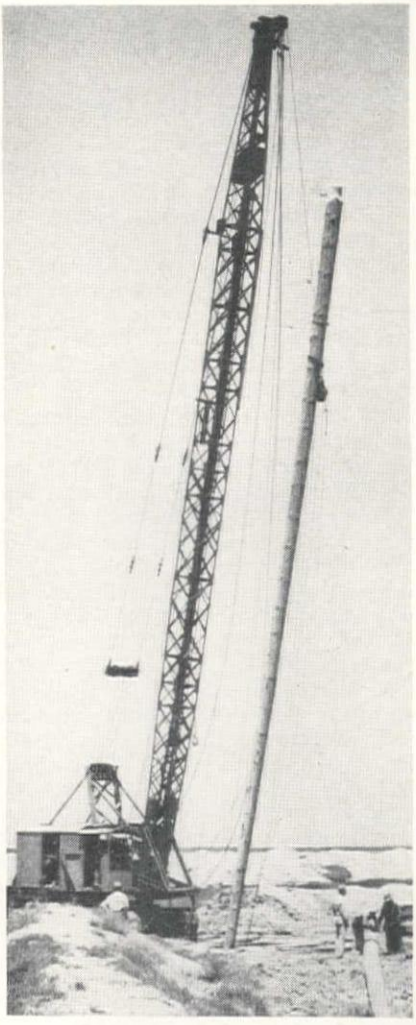
A crawler crane with 85-ft. boom was selected and fitted out with light 32-ft. swing leads and a 4,000-lb. drop hammer. Procedure for driving the piling was then as follows. Prior to raising each pile into position, a 4-part ¾-in. wire rope tackle was fastened to the pile near the butt. Each pile which weighed about 3½ tons and had a 9-in. tip and 18-in. or more butt, would settle into the clay 15 ft. or more under its own weight. The tackle was then hooked to the nearest pile already driven, or as in the case of the first pile in each anchor location, to an outrigger at the bottom of the crane boom. A tractor was then hooked to the head line which was reeved to lead from the bottom, and while the tractor furnished the power for the tackle, the crane boom and load line held the pile to proper angle while it was pulled into the ground.

A direct pull of 20 tons was thus obtained to bring the butt of the pile to within 35 ft. of the ground surface. At this stage, the pile was rigid enough to support the swinging leads with the hammer. During the driving, the pile was kept to the desired batter by having the tractor pulling the pile by cable in a direction opposite to any tendency for the pile to lean out of position.

Although the procedure was relatively slow—an average of 4 piles being driven per day—the method proved to be comparatively economical.

Barrett & Hilp, general contractor of San Francisco, had the contract for the foundation work on the project. The author was superintendent for the firm on the job. The foundations were designed and built under the direction of H. J. Brunnier, consulting engineer of San Francisco.

*Formerly superintendent for Barrett & Hilp, San Francisco.



Seneca Reservoir

. . . Continued from page 91

tower deck. The valve stem housing also provides means of adjusting the packing gland from the tower deck. This is one of the first installations where a plug valve has been installed to operate in the submerged condition. The tower can be un-watered for inspection and maintenance by closing the sluice gates and draining out through the inlet-outlet line.

The hydraulic cylinder is activated by water pressure through a pilot valve control. Two sources of pressure are provided that are in excess of 50 p.s.i. The main pressure source is from the local pressure zone, and an auxiliary source is provided by a pump and pressure tank mounted on a vacuum valve structure. When the pilot valve piston is in its highest position (water surface at elev. 298) the hydraulic cylinder will receive high pressure from the pilot valve, closing the plug valve.

The pilot valve is raised or lowered by means of a copper float. As the reservoir water surface drops, the float rides free of the hollow spindle until it reaches the lower stop collar. As the float leaves the upper stop collar, the hollow spindle and piston would be free to drop at every lowering of the water surface. To prevent this, a control spring has been provided so that the spindle and piston will drop only to the neutral position. The neutral position is when both pressure lines to the hydraulic cylinder are cut off from the high pressure source by the pilot valve piston. As the float continues to drop and finally engages the lower stop collar, the weight of the float will depress the control spring, forcing the piston to move down to its lower position. This will allow high pressure to enter the cylinder and open the plug valve.

If the control spring or some similar device were not used, the valve control gear would "hunt" or oscillate with every small fluctuation in water surface, causing the controls and valve to overwork unnecessarily. The pilot valve and the hydraulic cylinder are interconnected by the two pressure lines as indicated above. This forms a closed system so that a means must by provided for the release of water from the hydraulic cylinder as it operates. In the case where the pilot valve piston is in the high position and the hydraulic cylinder is closing the plug valve, water will leave the low pressure side of the hydraulic cylinder and will enter the pilot valve at the lower pressure connection. This water is released from the pilot valve by entering the ¼-in. diam. pressure release hole and thence out through the hollow spindle. When the pilot valve piston is in the lower position, water from the low pressure side of the hydraulic cylinder can enter the pilot valve through the upper pressure connection and thence into the hollow piston and out of the system.

John W. McFarland is Acting General Manager of the Utility District, and work is under the general supervision of Joseph D. DeCosta, Manager of the Engineering Division. J. W. Trahern is Supervising Civil Engineer in charge of design, and R. E. Layton is Senior Civil Engineer. G. W. Colby is Senior Civil Engineer in charge of the field engineering, and Richard Adams is acting as Resident Engineer.

Roscoe W. Phillips, principal in the firm of Erickson-Phillips & Weisberg, is general superintendent for the contractor. Subcontractors include Ariss-Knapp Co., Oakland, grading, and Gallagher & Burk, Inc., stabilized sub-base.

Treated Piling Serves for 57 Years

Creosoted timber piling originally used 57 years ago in a Southern California wharf has already outlived four structures and many of the old piles are still in active service

By W. R. BOND*
Portland, Ore.

AN INSTANCE of repeated salvage of timber piling which will be difficult to duplicate is contained in the history of the piling originally used by the Southern Pacific Railroad in 1891 for construction of the Santa Monica long wharf in Southern California. Piling salvaged from the wharf has already outlived four structures in which it has been used, and the final chapter in the long service life of these piles has not yet been written.

For construction of the foundation and substructure of the Santa Monica long wharf, which extended 4,000 ft. into Santa Monica Bay, the Southern Pacific Railroad used coast Douglas fir piles, pressure-treated with creosote oil at the company's own San Pedro plant. As this piling was for use in salt water and subject to marine borer attack, it was given the "full cell" treatment to "refusal" and a net retention of 14.17 lb. of preservative was obtained. That is, about 1½ gal. of creosote oil for every cubic foot of timber remained in the piling on completion of the treatment. Piling that is used in fresh water or for inland use is normally given an "empty cell" treatment of 10 or 12 lb. per cubic foot. The Santa Monica wharf was used by the railroad as a landing for both coastwise passenger liners and freighters. An immense and variegated amount of tonnage and traffic was handled over it during the period of its existence.

Piles salvaged and re-used, 1916

After serving for 25 years in this capacity (until 1916), the piles were pulled when Southern Pacific Railroad decided to dismantle the wharf after discontinuing its use. Even though the piles were installed in waters severely infested with marine borers, they were found to be in such excellent condition that about two-thirds were salvaged and re-used. Thus the first chapter of service was completed.

Most of these piles on which records have been maintained were used in the foundation of a wing of the Sunset Pier which was then in the City of Venice. Others were used for foundations of the municipal auditorium for the City of Ocean Park. This later became a part of the City of Santa Monica. It was about 1921-23 that contractors Murdock and Condeere picked up and drove the salvaged piles for Sunset Pier. A ballroom was built contiguous to this pier at the same time in which untreated piles were used in the foundation. It is interesting to note here that the untreated piles were destroyed by teredo attack in 2 to 3 years and had to be replaced. In 1926, Venice was annexed into the City of Los Angeles and the Department of Recreation and Parks took charge of the Sunset Pier.

Piles re-salvaged, 1929

Later, in 1929, when the salvaged piles were 38 years old, Sunset Pier was remodeled. This involved a shortening of the pier length from the outer end and a repair and strengthening of the inshore end to accommodate more concentrated and heavier traffic.

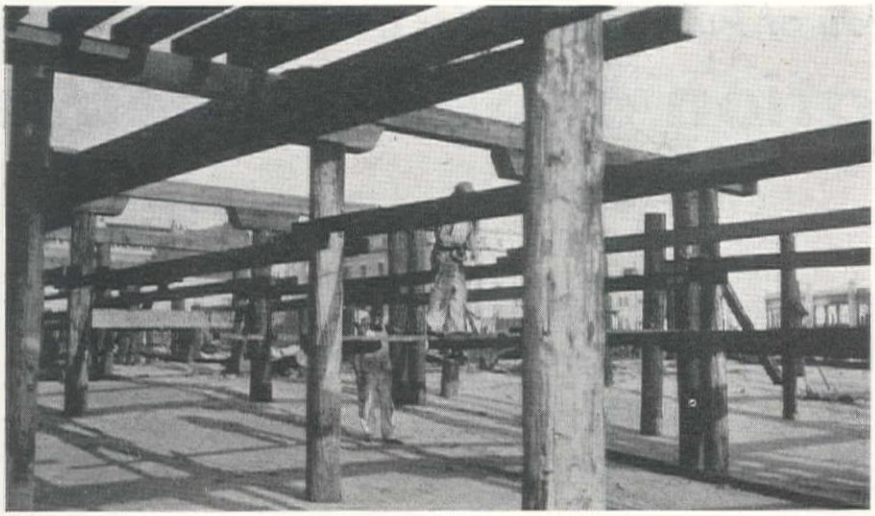
Floyd L. Holster of Los Angeles County was the contractor on this work. About 60 piles were pulled from the outer end of the pier. These were found to be in such excellent condition, when the marine growth which had accumulated on them during their years of service was removed, that most of them were re-used for repairing and strengthening the inshore end. These were driven on a batter through openings made in the deck and then pulled into place beneath the caps. Holster advised that the unused piles were sold for use elsewhere but no further record is available.

Late in 1948, after the beach at Sunset Pier had been extended beyond the westerly end of the pier, the City of Los Angeles called for dismantling of the

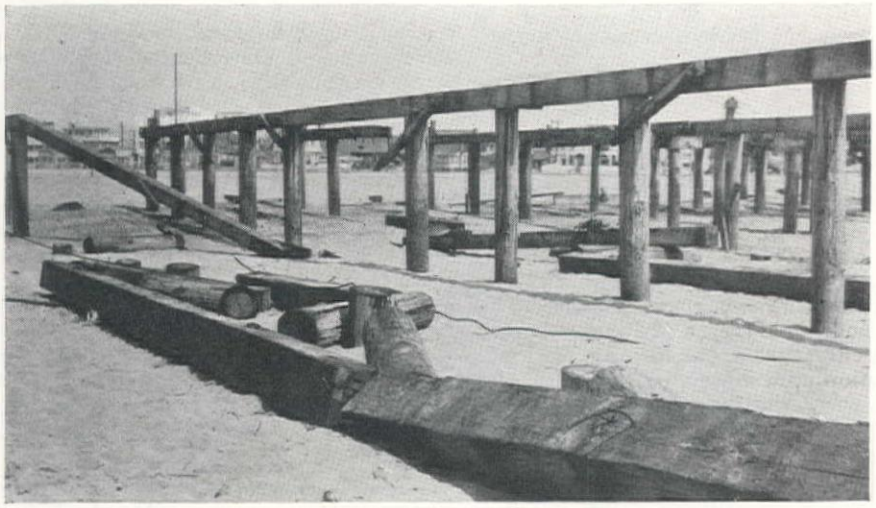
ONE of the piles cut after 57 years of service shows excellent penetration of creosote, which was originally applied by pressure treatment.

THE ORIGINAL Santa Monica Long Wharf, built in 1891-1892 by the Southern Pacific Railroad, was 4,000 ft. long and contained 132,000 lin. ft. of creosoted Douglas fir piling. The wharf was dismantled in 1916 after the piles had been in water for 25 years.

* Engineer in the employ of the American Wood-Preservers' Association, Chicago, Ill.



IN 1929, the piles were installed in a parking pier for a municipal auditorium at Ocean Park, Calif. The photograph above of this pier was taken in 1929, when the piles were 38 years old.



THE RE-SALVAGED piles were also used in 1929 for a pier at Venice, Calif. View above was in 1948 when this pier was being demolished. Piles were still sound after 57 years.

remaining portion of this pier. Earl Beasley of Santa Ana was the successful low bidder and was awarded the contract.

Piles sound after 57 years

The dismantling of this Sunset Pier provided an excellent opportunity to observe the condition of the piling after 57 years. About 8 ft. of the upper section of all pilings was visible above the sands at the time this inspection was made. That portion mainly subject to possible marine attack was, of course, covered by sand. All of these piles, however, were performing their job in supporting the pier until final dismantling. That the balance of their length was still sound was indicated by the firmness of the piles in the sand and the difficulty experienced in pulling them out.

Cut-offs from these existing piles indicated that the majority were still sound. Photographs taken at that time show the dense penetration obtained by the full cell treatment to refusal with creosote.

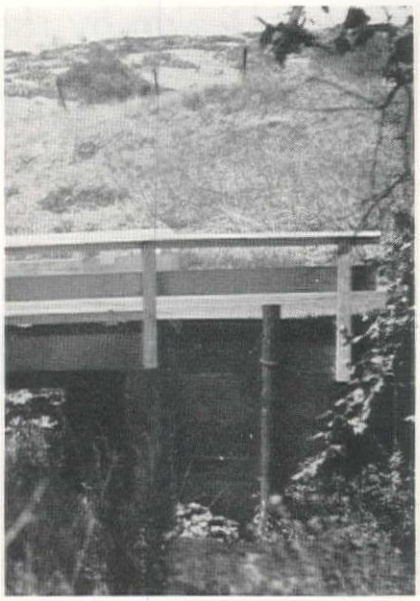
It was thought then that the final chapter in the long service life of these piles had been written. However, in November, 1949, H. Springer, Road Commissioner of Orange County, Calif., wrote that the contractor who had dismantled the Venice Pier had called his office that year to inquire if he would be interested in buying some "good" used piling. These were inspected and the selected piling was purchased and taken into Orange County's bridge and culvert stock.

Still in active service

Some of the re-salvaged piling has already been used on repair work, short culvert posts, wing piling, etc. So the old piles are still in active service and their ultimate record of service life will depend upon their identification and record as may be maintained by the Orange County Highway Department.

While there was no method for definitely identifying or determining the origin of the individual piles, the records of the Southern Pacific Railroad and extensive checking with the contractors who pulled and drove these piles all combine to prove fairly definitely that most, if not all, of these piles came from the salvaged Santa Monica long wharf built in 1891-2.

Many other equally long records of service life are available covering pressure creosoted timbers and piling but it would be difficult to locate one in which material has been salvaged and re-used as many times as these piles were and still be sufficiently sound to serve again.



FURTHER RE-USE of the 57-year old re-salvaged piling is being made by the road department of Orange County, Calif. The department bought selected piling from the contractor who dismantled the Venice pier for use on repair work, short culvert posts, wing piling, etc.

Engineer Graduates to Meet Competition for Employment

ENGINEERING graduates of the next few years can expect to meet sharply increasing competition for employment, according to a report issued by the U. S. Department of Labor. There will be about 10% more graduates this year than last, and nearly 400% more than in prewar years. However, the number of engineers employed is increasing rapidly. Many members of this year's graduating classes may be unable to find professional engineering positions, although their training may help them get administrative, sales or other technical positions. These facts and other findings of the department are contained in a 120-page bulletin entitled "Employment Outlook for Engineers," available from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at 50 cents per copy.

AEC Plans $1,500,000 Bridge

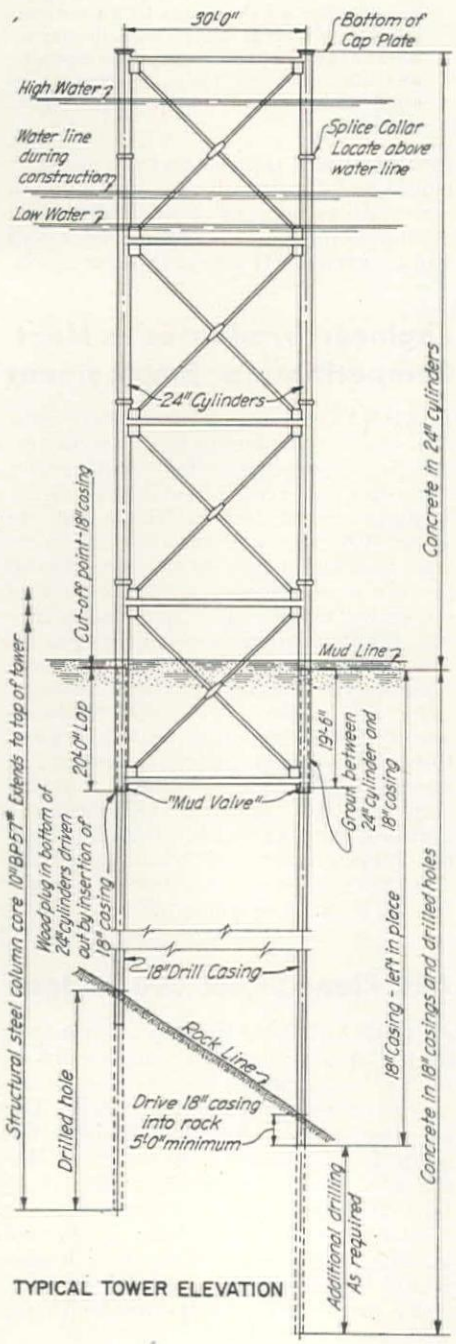
A NEW $1,500,000 BRIDGE is planned by the Atomic Energy Commission to replace the existing structure over the Yakima River at Richland, Wash. The existing bridge, built in 1920, is inadequate for the heavy loads necessary for the construction program at the Hanford AEC plant, and the bridge has been reduced to one-lane traffic to control loading. Main span of the new bridge would be a concrete arch 215 ft. long. Total length of the bridge will be 650 ft., with a width of 50 ft.

Unique Design by the Bureau of Public Roads for a—

Bridge Foundation of 340-Ft. Depth

Lateral support provided by material below top layer of mud made possible an economical foundation design with steel bearing piles to record depth—Towers fabricated as sunk support piles through mud and water

A DEPTH of 340 ft. to suitable rock below the grade of a proposed bridge demands a unique solution in bridge foundation design. An unprecedented design was developed to meet such a problem by the engineers of Division 8, Bureau of Public Roads at Portland, Ore., for a structure on a U. S. Forest Highway in northern Idaho. Steel piles extending all the way to rock would provide adequate bearing, if an economical method could be developed to provide lateral support through about 90 ft. of water to mud line, and as much lower as required. The ingenious scheme which has been used to meet this problem involves ideas of interest to every designer and builder of bridges and bridge foundations.



TYPICAL TOWER ELEVATION

Location and its problems

The bridge site is across the narrow neck of Blue Creek Bay on the eastern arm of Lake Coeur d'Alene in northern Idaho. The route around the end of the bay adds about 5 mi. to the length of highway required to cross at the proposed bridge site.

The first design proposed for the crossing provided a 1,200-ft. suspension span. A second design called for a fixed-grade pontoon bridge, crossing the 1,350-ft. neck of the bay. Preliminary cost estimates on both these suggested designs were almost $2,000,000, which was about double the funds available for the project. A plan to extend the highway around the bay was considered, but the additional length of 5 mi. and extensive curvature of the location made this solution undesirable. However, this last idea was seriously studied when the cost estimates for the previous designs were announced.

As the next step in the engineering analysis of the problem, additional foundation studies were ordered. These further explorations were undertaken to determine if another type of bridge design might be feasible, or possibly a rock-fill causeway could be constructed.

Foundation depths indicated by these additional tests showed the following maximum vertical distance to rock below grade line of the bridge (Elev. 2176). The distance to the high water of the lake is about 35 ft., and low water level is about 20 ft. below. Between high water level and mud line is a distance of 90 ft. At the location of the center tower (see drawing) there is an approximate depth of 210 ft. of mud and earthen material to bedrock. These distances represent an aggregate maximum depth of about 340 ft. from grade to rock line.

Material provides lateral support

Such a foundation condition would normally rule out long, steel bearing piles because of lack of lateral support. Further, the cost of bracing these piles for their full length in mud would be prohibitive. Possible use of large diameter steel columns sunk by dredging and filled with concrete was considered and abandoned because of equally high cost.

The most important engineering information developed by the supplementary exploration related to the character of the material below mud line. The original concept of this material considered it to be a rather soft mud for almost its entire depth to rock. However, the new borings showed only 25 ft. of soft mud, followed by about 30 ft. of hardpan and consolidated clay. Below this was about 45 ft. of "rock dust," and then compacted sand to rock. The character of this material showed that steel bearing piles would have adequate lateral support in this foundation material up to the top 20 ft. of mud. The vertical distance between this lateral support and bridge deck would be about 145 ft.

With this change in the known conditions, the design possibilities, based on substantial lateral support, permitted consideration of a new and relatively unusual design.

Final design

Steel bearing piles were now a logical means of support, provided they could be braced from mud line to deck elevation. The next problem was to develop a feasible design for a simple system of bracing for these supporting piles.

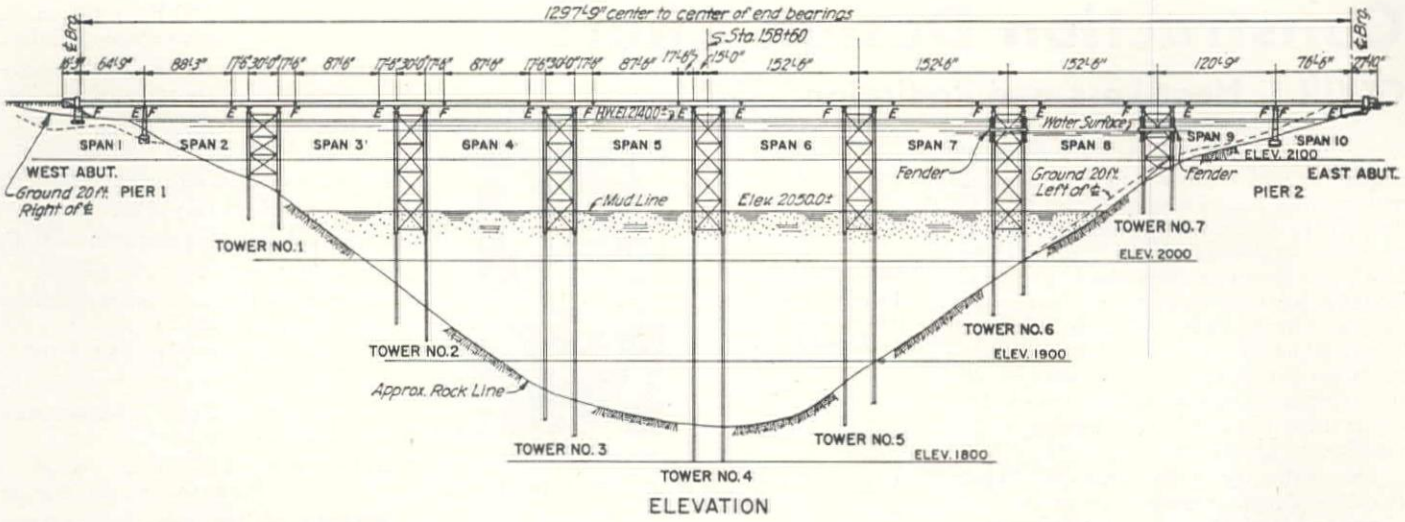
After a certain evolution in design, the final adopted plan provides steel cylinders at each corner of the towers, which are 30 ft. square. These cylinders are braced to form a tower by a system of structural steel diagonals. The cylinders not only provide lateral support, but also represent a template and guide for driving the piling.

The next step in design was to develop a means of constructing these towers and sinking them into the mud by methods which would be feasible and economical at the remote site. As finally developed, the plan which was suggested for the contractor was the assembling of the tower sections from barges anchored at exact locations. The tower sections, consisting of corner cylinders and diagonal bracing, would be supported between the barges and lowered into the water as sections were added.

The cylinders at the corners are of 24-in. diameter and extend down into the mud. The bottom of the cylinders, as they are sunk, is provided with a wooden plug to keep out mud and provide some buoyancy.

After reaching mud, 18-in. steel casing is introduced inside the 24-in. cylinders

SCHEME developed at the Portland office of the BPR (drawing at left) for providing lateral support for steel bearing piles which extend a maximum depth of 340 ft. from high-water line to rock.



ELEVATION

PROFILE across neck of Blue Creek Bay, above, showing foundation depths which led to preliminary studies for a suspension bridge or a rock-fill causeway. Studies showed that material below the top layer of mud would provide lateral support for steel bearing piles. Original plan called for tower supports only to mud (see above), and the final design included the use of 18-in. casing, which was filled with concrete after the pile was in position (see drawing opposite page).

and sunk by excavating through the mud to rock line (see drawing). After reaching rock, holes are to be drilled from the 5-ft. minimum to a depth of 20 ft. or more, depending on the character of the rock. Mud and rock fragments are then to be washed out of the cylinders and the support is then ready for the placing of the steel supporting column. This supporting element is a 10-in. BP section of 57-lb. weight.

After seating, the tops of the columns are to be burned off and ground to exact elevation. Lastly, the space between the 24-in. cylinder and the 18-in. casing is to be grouted. This is the 20-ft. overlap of the two between mud line and firmer material. The entire cylinder is then filled with concrete.

This foundation system provides bearing piles with loads which do not exceed 6,000 lb. per sq. in. for the piles in "point bearing." No friction is considered in this support system.

On these towers will be erected 87-ft. plate girder spans and the remainder of the structure will be a conventional concrete deck of 2-lane width.

The system of underwater bracing and the method of erection described in the foregoing is considered to be an innovation in bridge design and construction. It made possible an economic design for this project at a cost which was only half that for more conventional designs. Further, the system lends itself to adaptation for other bridge locations where underwater support must be provided for long piling.

Personnel

The Blue Creek Bay bridge was designed in the office of Division 8 of the Bureau of Public Roads at Portland. W. H. Lynch is Division Engineer. The design was developed and the proposed method of construction was recommended by R. B. McMinn, Bridge Engineer at the Portland office.

Contract for the project was let to Paul Jarvis, Inc., of Seattle, Wash., at a bid of $871,155. Preliminary work was started late last fall and the foundation work reviewed in this article will be actively under way during the present construction season.

Note: The foregoing description of the construction procedure outlined as part of the engineering plans for the Blue Creek Bay Bridge may be modified in certain details by the contractors. For example, the contractor may elect to erect the steel towers from pile platforms rather than barges. The actual details of construction methods will be reviewed in a later article.

Efficient Fishway Designed for Ice Harbor Powerhouse on Snake River

DESIGNS for the powerhouse at Ice Harbor Dam on Washington's lower Snake River, which will be the first part of the dam construction when money is appropriated by Congress, have reached an advanced stage, according to Col. William Whipple, Walla Walla District Engineer, Corps of Engineers. Plans pertaining to passage of salmon upstream and fingerlings downstream through the powerhouse have been submitted for comment to the U. S. Fish and Wildlife Commission and the Washington state fish and game commission, in accordance with the law authorizing the project.

The plans for fish-passing facilities, the overall cost of which is estimated at $8,000,000, are quite similar to those at McNary Dam on the Columbia River, but one major change is being studied. At McNary, the water for attracting salmon to fishway entrance will be drawn by gravity from the upper pool or pumped from the pool below. Neither solution is entirely satisfactory, since this provision of water will cost McNary Dam almost 20,000 kw. of power; and in addition, the pressure jets create turbulence which is injurious to fingerings.

For Ice Harbor, a tentative design has been worked out to operate two of the turbines at reduced head, discharging them into a special passage 7 ft. above tailwater. This water then will be passed directly and smoothly into the fishways, avoiding extra turbulence due to jets.

Foreigners Buy Equipment After Visiting in the U. S.

NEARLY $1,600,000 in equipment contracts have been placed with American industry by foreign governments as a direct result of technical assistance in water resources development extended by the Bureau of Reclamation, according to Secretary of Interior Oscar L. Chapman. Engineering know-how acquired by the Bureau is placed at the disposal of visitors representing foreign governments. The visitors are taken on inspection tours of Hoover Dam, Grand Coulee Power Plant and other multipurpose water conservation projects in the 17 Western States, and participate in technical studies and discussion at the office and laboratories of the Branch of Design and Construction at Denver, Colo. Recently, the Chief Engineer of one of the Indian provinces placed orders for equipment and supplies aggregating $1,000,000 following a tour of reclamation activities and consultation with the Bureau's engineers.

WINSTON BROS. CORP., Azusa, Calif., has started work on the first major construction contract offered on the $36,000,000 Whittier Narrows Dam on the San Gabriel River in Southern California. The firm was awarded a $3,022,478 contract last month by the Los Angeles District, Corps of Engineers, for construction of the east embankment and the spillway. The second contract, for earth embankment, will not be up for bids until next year.

Construction Design Chart

CXVIII . . . Heat Loss and Radiation

By

JAMES R. GRIFFITH
Dean of Engineering
University of Portland
Portland, Ore.

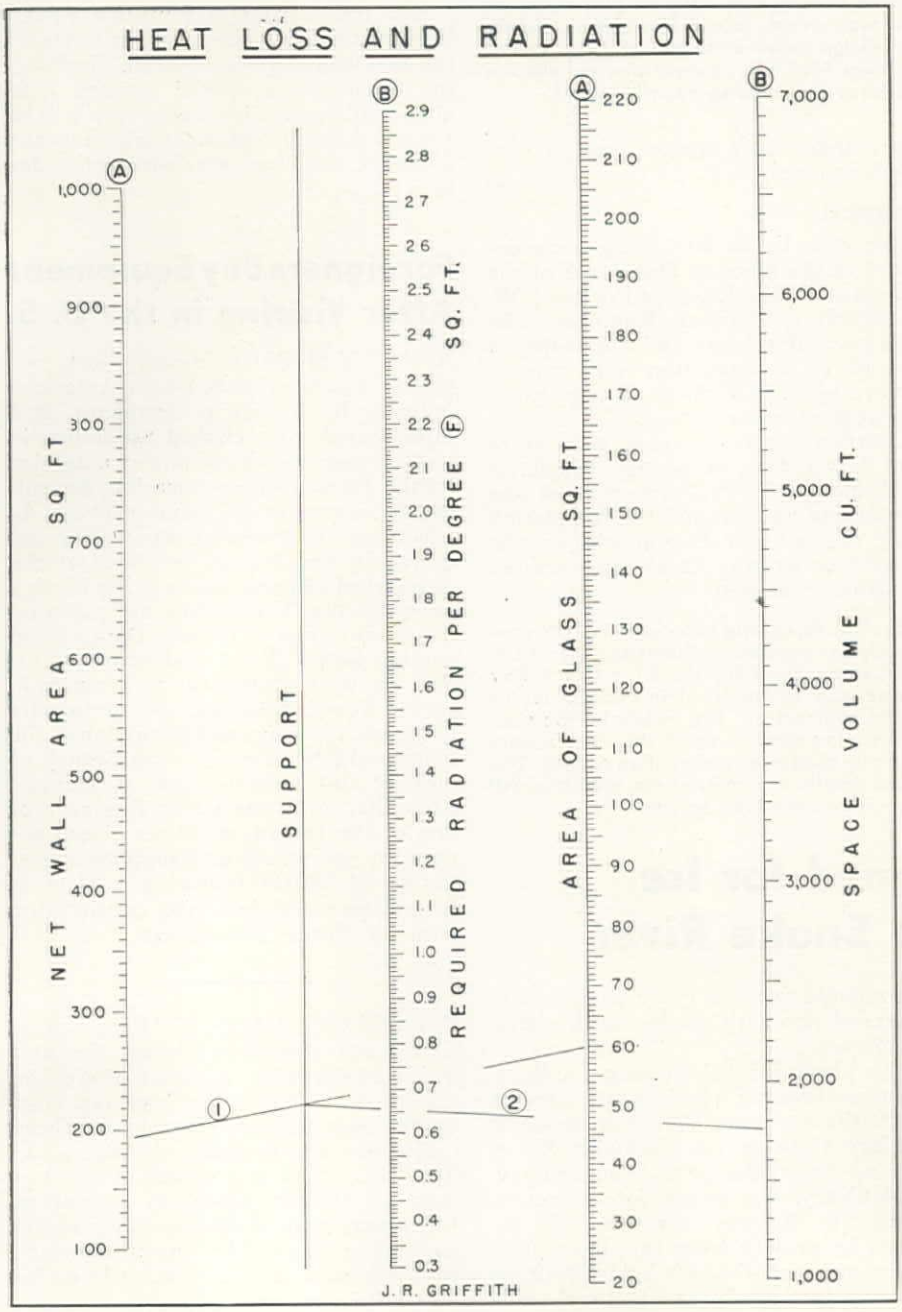
I KNOW THAT many civil engineers will wonder why this sort of material has been included. I also may be subject to criticism by the mechanical engineers in the other camp. On the other hand, construction engineers do occasionally have to estimate the necessary radiation in the design of camp buildings. The method of computing the necessary radiation herein utilized may not have all the refinements demanded by the specialist, but at least it is simple and should give an intelligent "guestimate."

The February 1948 issue of *Trane Weather Magic* included an article "A Simplified Method of Figuring Radiation," which very much appealed to me on account of its simplicity. Four average heat loss factors were given therein, as follows:

Wall factor = 0.32 B.t.u. per hr. per sq. ft. of area.

Contents factor = 0.02 B.t.u. per hr. per cu. ft. of volume.

Glass factor = 1.00 B.t.u. per hr. per sq. ft. of area.



Radiation factor = 240 B.t.u. per sq. ft. of average radiation.

In order to illustrate the use of the above basic factors, the reference used the following specific example:

Room size, 14 ft. x 14 ft. x 9 ft.

Glass window area, 60 sq. ft.

Walls, exposed on two sides.

Outside minimum temperatures, —30°F.

Inside temperature desired, +70°F.

The net area of the exposed wall, gross less window area, would be

Wall area = 2 (9 × 14) — 60 = 192 sq. ft.

The heat loss per degree (F.) temperature differential would then be

Wall heat loss = 192 × 0.32 = 61.44 B.t.u. per hr. per degree.

The contents of the room, or volume, would be

Contents = 14 × 14 × 9 = 1,764 cu. ft.

and the heat loss due to this volume would be

Contents heat loss = 1,764 × 0.02 = 35.28 B.t.u. per hr. per degree.

The heat loss due to the glass window exposure would be

Glass heat loss = 60 × 1.00 = 60 B.t.u. per hr. per degree.

The total heat loss would then be the sum of the above individual values, or

Total heat loss = 61.44 + 35.28 + 60 = 156.72 B.t.u. per hr.

for each degree of temperature differential. In order to maintain an inside temperature of 70°F., when the outside temperature is —30°F., the total heat loss would be

(70 + 30) × 156.72 = 15,672 B.t.u. per hr.

The radiation needed would then be

$$\text{Radiation} = \frac{15{,}672}{240} = 65.3 \text{ sq. ft.}$$

The accompanying chart utilizes the same factors given in the Trane publication, and requires but two solution lines intersecting on the "SUPPORT." The (A) scales are used with one solution line, and the (B) scales with the other. Using the same problem as solved above, solution line (1) has been drawn between the values: Net wall area = 192 sq. ft., and Glass area = 60 sq. ft. Solution line (2) has been drawn from the intersection of line (1) and the support, to the value of Space volume = 1,764 cu. ft. On the scale giving the required radiation, a value by solution line (2) will be noted of

Radiation = 0.655 sq. ft. per degree.

Thus for the total temperature differential, it would be necessary to have

Total radiation = (70 + 30) × 0.655 = 65.5 sq. ft.

as compared to the 65.3 sq. ft. obtained in the illustrative problem.

The original Trane article lists certain adjustments to be made when computing radiation under specific conditions. These are as follows:

Add 10% for north exposures or prevailing winds.

Floors and ceilings exposed to the

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Portrait of a Self-Taught Engineer

A. M. Rawn has never stopped educating himself, although his formal schooling was limited — The chief engineer and general manager of the Los Angeles County Sanitation Districts is a foremost authority on problems of sewerage

By THOMAS A. DICKINSON
Los Angeles, Calif.

AT A RECENT social gathering in Los Angeles, a number of veteran engineers became reminiscent about "the good old days in college" and one member of the group managed to make himself conspicuous by saying absolutely nothing. So, eventually, one of the talkers politely tried to help the taciturn guest get into the spirit of things by asking:

"By the way, Rawn, where did you go to school?"

Rawn—a big, distinguished-looking gentleman—shrugged, as if he did not know he had suddenly become the center of attention, and slowly replied: "Let's see now—I believe it was Public School Number 9 at Toledo, Ohio."

The listeners roared with laughter. Imagine such a remark being made by A. M. Rawn, chief engineer and general manager for the Los Angeles County Sanitation Districts!

"They wouldn't believe that I wasn't joking," Rawn now avers, "and, in a way, I wish they had been right."

No boaster

The latter remark apparently classifies Rawn as a Great American Rarity—i.e., an eminently-successful man who does not love to boast that he is educationally self-made.

"You see," he explains, "there was nothing to stop me from getting an engineering degree. In fact, I could have saved myself a lot of headaches and hard work if I had gone to college. But I didn't realize how important a formal education could be until I had figuratively educated myself. I qualify the last statement with the word 'figuratively' because I feel that I haven't stopped learning to this day, although many years have passed since the time when I could have gained considerable knowledge as a college freshman."

Rawn comes from an engineering family—having more or less directly inherited his profession from his father Abel on the day of his birth (November 2, 1888)—and his failure to seek a formal engineering education can be attributed simply to the belief of American pioneers that a man should be able to educate himself once a schoolmarm has helped him to master the three R's.

"A man **should** be able to educate himself," Rawn continues. "But, if he's got the ability to learn, he can get a better education in less time with the aid of a teacher."

Efforts and accomplishments

This sort of talk might give the impression that Rawn suffered tremendous hardships in his early post-school days; but, actually, he was able to earn more than enough spending money from spare-time work as a surveyor's assistant before he left high school, and by 1912 his competence was such that he became a full-fledged engineer for the U. S. Reclamation Service (now the U. S. Bureau of Reclamation).

Lack of an engineering degree was a handicap which caused Rawn to enlist in the U. S. Army after the United States became involved in World War I during 1917, but service with the 319th and 605th engineer regiments of the A. E. F. soon enabled him to prove that he was worthy of a commission—as evidenced by the fact that he was a first lieutenant in 1918.

Except for the time he spent with the Army during World War I, Rawn's work for the U. S. Reclamation Service extended from 1912 to 1924 and was devoted to a variety of outstanding projects—including those at Yakima, Boise, Salt River, King Hill, and what later became the Grand Coulee Project.

From 1924 to 1941, he served as assistant chief engineer for Los Angeles County Sanitation Districts in California; and, in this capacity, he distinguished himself with his efforts in connection with the vast sewage-disposal system which now serves 35 of the 45 cities in Los Angeles County—probably the largest system of its type in the world today.

A. M. RAWN

Since 1941, Rawn has been chief engineer and general manager for Los Angeles County Sanitation Districts; and, at this writing, he is generally recognized as one of the world's foremost authorities in one of the most highly-specialized branches of civil engineering work.

Extra-curricular activities

In addition to strictly technological accomplishments, such as the development of a process for the multiple-stage digestion of sewage sludge, he has collaborated with Dr. H. K. Palmer in preparing the only existent treatise on the diffusion of sewage in sea water and has been widely acclaimed for a variety of extra-curricular engineering activities.

The latter activities began in 1939 and 1940, when Rawn served as a member of the Engineering Consulting Board for San Francisco's East Bay Cities Sewerage Survey. Then, in 1941, he became a consulting engineer to the constructing quartermaster of the U. S. Army and helped plan sewerage and refuse disposal systems for major army cantonments.

He acted as ex-officio director of sewerage and sanitation work for the Government Division of the War Production Board from 1943 to 1945, since which his manifold duties have included constant service as a consultant to the Engineering Board of Portland, Ore., in planning and constructing Portland's sewerage works.

From 1946 to 1947, Rawn also found time to serve as chairman of the Consulting Engineering Board which prepared a special report on sewerage for Orange County, Calif., and as a consultant to the engineering board which prepared a report on sewerage for Santa Clara County, Calif.

In 1949, he became a consultant to the City of Vancouver, B. C., Canada, in the planning of new sewerage works and has recently been named as a member of the California State Water Pollution Control Board by Governor Earl Warren.

Active in societies

Despite his many full and part-time duties as an engineer, Rawn has managed to remain an active member of numerous societies — including the American Society of Civil Engineers, the Society of American Military Engineers, the California Sewage Works Association, the American Water Works Association, and the Arizona Sewage and Water Works Association. He is an honorary member of Tau Beta Pi and Chi Epsilon.

Further, he was president of the California Sewage Works Association in 1935; president of the Los Angeles Sec-

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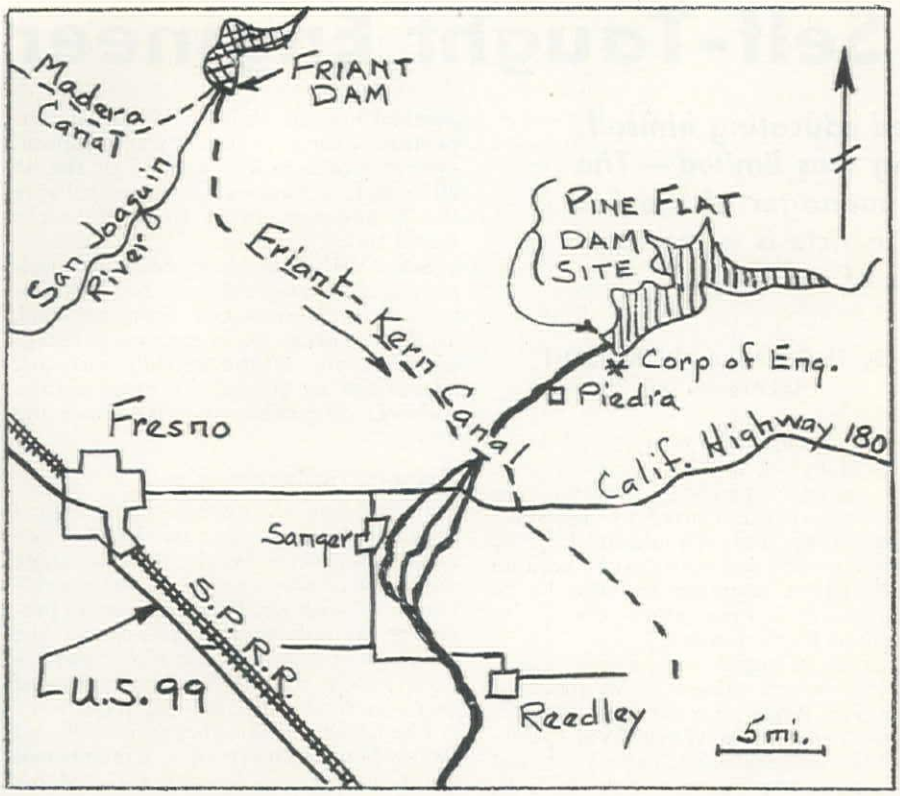


Pine Flat Dam Preliminaries

—A Sketch of Activities Taken From . . .

. . . Notes prepared after visiting the Corps of Engineers' field office and the contractor's headquarters

YOUR ROAD leads straight east from Fresno through the suburbs of the city (94,000 pop.) and out across the flat valley. On both sides of the road grape vines march off in endless rows. The atmosphere is of a rich rural community.

To those who have visited other large dam projects, the approach lacks dramatic views of mountains and the desert.

Turning northeast, the foothills begin to appear with the snow-covered Sierra in the background. Just about where the first of the foothills start putting curves in the highway, the road leaves the main highway and becomes a winding county road. There is still no evidence of a major construction project with the exception of a few well-rooted trailers which might belong to construction men.

The road crosses the Friant-Kern canal, flowing south from Friant Dam with a capacity of 5,000 sec. ft.

The small town of Piedra is the end of a branch railroad line which was built during the First World War to reach the strategic mineral deposit. This deposit and the railroad branch have not been in use for many years. A few miles further is a marker with the well known symbol of the U. S. Corps of Engineers, indicating that you are approaching the location of the Pine Flat Project and the project office.

Government camp

On the south side of the Kings River, the Sacramento District of the Corps of Engineers has completed its establishment, including a permanent office building, shops and dormitory which will be used through the construction period and then continue in use for the operating staff. Grouped behind the main building are about 20 portable residences for the families of the engineering staff.

John I. Thomas is the engineer in active charge of the project. His offer to provide a brief conducted tour over the site and present construction preliminaries is a pleasant invitation after a look at the condition of the available construction roads.

Abutment work

The first excursion is up the south abutment around hairpin turns climbing to the ultimate crest elevation. This road will ultimately be improved and provide access to the crest of the finished structure. Above this elevation is a low-gear gravel trail climbed with spinning wheels and clouds of dust. Finally we stopped at some rock drilling and excavation work which marks the site of the track that will carry the head-towers of the cableways to span the canyon. The area is confined and the crew is small, but two-shift operations will soon be extended to include a third shift to speed up this essential feature.

The straight track will handle two towers.

Back down the road the trip continues across a new bridge to the north side of the river. The bridge was completed under separate contract as a preliminary to the job.

High up on the north abutment, a bulldozer is breaking a zigzag road up to the elevation of the track for the tail-towers. This will be a straight track parallel to the one on the south abutment. The road leads up to the location which will be set aside as an observation point for the public. A parking area will be provided and an observation platform from which visitors can look down into the canyon and observe the concrete placing.

You will be able to reach this observation point from a county road being re-routed up the north side of the canyon and around the high-water line of the reservoir.

The excavation of both abutments was carried out under two previous con-

FACTS ABOUT PINE FLAT DAM

History: Recognized as an important storage and conservation project since the 20s, the first investigation by the Corps of Engineers was in 1927. In 1936 the Flood Control Act provided authority for a report on the site, and money was allotted for planning.

Location: Kings River, Calif., about 27 mi. east of Fresno.

Direction: U. S. Corps of Engineers, Sacramento District, Colonel Joseph S. Gorlinski, District Engineer.

Preliminary excavation: Initial blast and ceremony for start of project May 27, 1947. Excavation for left abutment carried out by Piombo Construction Co., San Francisco, at $261,988. Excavation of right abutment by H. Earl Parker, Marysville, Calif., at $532,650.

Design features: Straight gravity section, with maximum height of 440 ft. above streambed. Total crest length 1,820 ft. divided into: right abutment, non-overflow, 789 ft.; center spillway section, 292 ft., and left abutment, non-overflow, 739 ft.

Volume of mass concrete, 2,150,000 cu. yd. Cement required, 1,600,000 bbls. Additional unclassified excavation, 100,000 cu. yd.

Spillway: Six radial gates, 42 x 38 ft. Ten conduits, 5 x 9 ft. A service bridge will cross the spillway section from the two non-overflow abutments. This roadway and bridge will be for servicing the dam and spillway.

Reservoir: Length, 19 mi.; shoreline, 67 mi.; maximum area, 6,300 ac., and maximum capacity, 1,110,000 ac. ft.

Main contract: Contract for the main dam was awarded to a group of well known Western contractors as a joint venture. The group consists of: Guy F. Atkinson Co.; Bressi & Bevanda Constructors, Inc.; Chas. L. Harney, Inc.; J. A. Jones Construction Co., and A. Teichert & Sons, Inc. The contract price is $24,339,776. Guy F. Atkinson Co. is the sponsor. On the job, the contracting organization is known as Pine Flat Constructors.

tracts and involved the removal of about 500,000 cu. yd. of over-burden and solid rock. The rock at the site is an altered granite and much of it is extremely hard. The former contracts carried excavation down to stream bed, and there remains a 20 to 25-ft. depth of gravel to rock below water level. The amount of rock to be excavated below the loose gravel will depend upon its condition as revealed.

Looking south across the canyon you see a rounded hillside immediately down stream from the abutment excavation. This marks the site of the batching and mixing plant. From the mixing plant a short length of shuttle track will move the mixed concrete to where it can be picked up by the cableways.

This includes a brief preview of the coming operations and a quick glimpse at the work now in progress. A word of thanks to Mr. Thomas and a promise to return in a few months ends the courtesy call on the Corps of Engineers.

Contractors' operations

On the north side of the river, a short distance below the dam site, Pine Flat Constructors has established temporary headquarters. Guy F. Atkinson Co. is the sponsoring member of the contracting group and is represented by Earl Jennett, Project Manager. On his absence from the job, you pay your respects to Guy Heimsoth, his assistant.

Up to the present time most of the contractors' work has been confined to planning the layout and details of the construction plant. These operations will begin at the gravel deposit in stream bed about 6 mi. below the site. They will include preparation of aggregate, a means of conveying this aggregate to the dam and the essential batching, mixing and placing equipment. In addition to these customary operations, specifications provide that the concrete be placed in the forms at a temperature which does not exceed 50 deg. F. This requirement during the summer months in the San Joaquin Valley will make necessary a cooling system which will form the most interesting feature of the concreting plant and procedure.

Starting at the downstream end of this sequence, the gravel will be dug from the channel by dragline and loaded into cars. Transportation upstream to the plant is planned by railroad with a 6-mi. haul. After being processed the aggregate would be elevated probably by conveyor belt, to the batching plant. All of these operations are in the study stage at the present time with the exception of some preliminary construction on the railroad line.

The contractors are using special thoroughness in the design of these facilities because the job is primarily one of producing aggregate, mixing and placing concrete.

No camp facilities will be provided by the contractor and no extensive labor force will be employed. Even at the peak of construction the crews will probably not exceed 900 men. Housing facilities are available in small towns and at trailer camps within easy driving distance of the site.

The supervisory personnel of the contractor will be quartered in specially rented houses in the town of Sanger.

Diversion of the river brings no serious problem with a stream bed, which is reasonably wide. Up- and downstream division wall of steel and wood construction will be cofferdammed at each end so that the river bottom can be worked on one-half at a time. First stage cofferdams will be of rock and earth construction, while the final cofferdams will be crib construction. After concreting is started on the south side of the river the flows can be carried through low blocks or the sluice conduits in the base of the dam.

Building operations of the contractor are at present confined to a warehouse and medical dispensary on the south bank of the river near the site. This group of buildings will be continued to include administration and other structures to house the contractor's headquarters organization.

Within a few months, you are informed, active work will be under way on much of the construction plant and the start of concreting is scheduled for this fall.

Cement will be trucked directly from the mill to silos on the job and present plans call for loaded trucks to come up one side of the river, discharge and return on the other bank to eliminate the need for passing on the relatively narrow roads in the canyon.

As you drive back towards town the impression resulting from the visit is fixed on the "manufacturing" aspect of the project. Little heavy earthmoving was required under the present contract and the contractor's operations are centered around the handling of the material.

Essential figures on the job are shown in the accompanying box and the next visit will be timed to report on major features of the construction plant.

Portrait of Rawn

Continued from page 99

tion, A.S.C.E., in 1938; president of the Los Angeles Engineering Council of Founders' Societies in 1940; director of the American Society of Civil Engineers from 1942 to 1944, and president of the Federation of Sewage Works Associations of America in 1944.

Simultaneously, he has found time to work as an editorial associate and as an editorial advisory board member for two magazine publications — "Water and Sewage Works" and "Sewage Works Engineering."

Most cherished of the multitude of honors that Rawn has received as acknowledgments of his engineering accomplishments is the A.S.C.E.'s James Laurie Prize for 1940.

As a personality, Rawn is remarkable for his intellectual integrity and extreme lack of vanity. He has a frank, man-to-man way of talking; yet he's never offensive—"even when you don't agree with what he says," as one associate put it—and he has a very flattering way of terminating his remarks in order to listen attentively when someone else wishes to add words to a conversation.

Although he is a confirmed Republican, Rawn is politically neutral in all of his official activities—believing, logically enough, that there should be nothing two-sided or controversial about sound engineering practices.

Physically and mentally, Rawn apparently lacks the attributes of a crusader; yet he has been a devout and strikingly successful exponent of more than one worthy cause. For example, he was among the first to propose and work for the A.S.C.E. Committee on Employment Conditions which has done so much to improve the lot of professional and sub-professional engineers in recent years.

Despite the seemingly-staggering burden of his current duties, Rawn has managed to retain much of the vitality and enthusiasm of a comparatively young man—all of which he believes is due to the fact that he's engaged in the sort of work he likes best. However, he does have a few regrets.

He is, for instance, sorry he can't find more time to devote to his hobbies—cabinet work and photography. His home at 1655 Queens Road, Los Angeles, contains one of the best amateur workshops in Southern California; and Rawn is one of the few non-professional photographers who can get consistently-good pictures with a 35mm. Leica camera.

As a public speaker, Rawn has gained a moderate degree of fame in the Los Angeles area by virtue of his ability to discuss many subjects both extemporaneously and entertainingly. However, he privately regards public speaking as a sort of necessary evil for men in public life and frankly admits he would just as soon listen to someone else.

In his capacity as an engineering executive, Rawn has learned that much of his own success depends on his capacity for impersonally evaluating the abilities of other engineers; and, curiously enough, it has been experience in this connection that finally changed his mind about the value of a college education.

"Naturally," he declares, "I'm not inclined to be prejudiced against engineers who learned things the hard way, as I did. On the contrary, I've been more inclined to be wary of the college men who applied for jobs in my department; and I must admit that I've encountered a few who seemed to think their diplomas were substitutes for competence. But, on the basis of my experience to date, I would say that there are at least a hundred good engineers with college degrees for every one like myself who happens to be self-educated.

"That's why I try to be very quiet whenever my associates start discussing the good old days in school. I'm not ashamed of my education, but I'm tired of explaining that I didn't go to college because no one told me it was such a convenient way of learning a lot of things in a hurry. However, if I had it to do over again, I'd string along with the colleges."

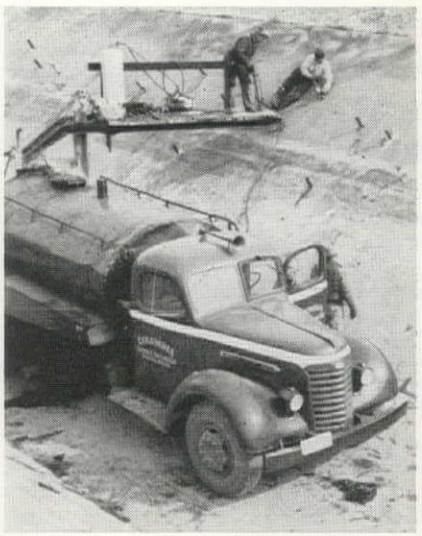
Asphaltic Sub-Seal Ends Seepage in Expansion Joints of Concrete Canal

THE SECOND extensive job of sub-sealing a concrete canal lining by pumping asphalt under pressure through holes drilled in the concrete was completed by the Bureau of Reclamation March 14. The first application of this new method at the Riverton Project in Wyoming was reported in the March issue of *Western Construction News* on page 81.

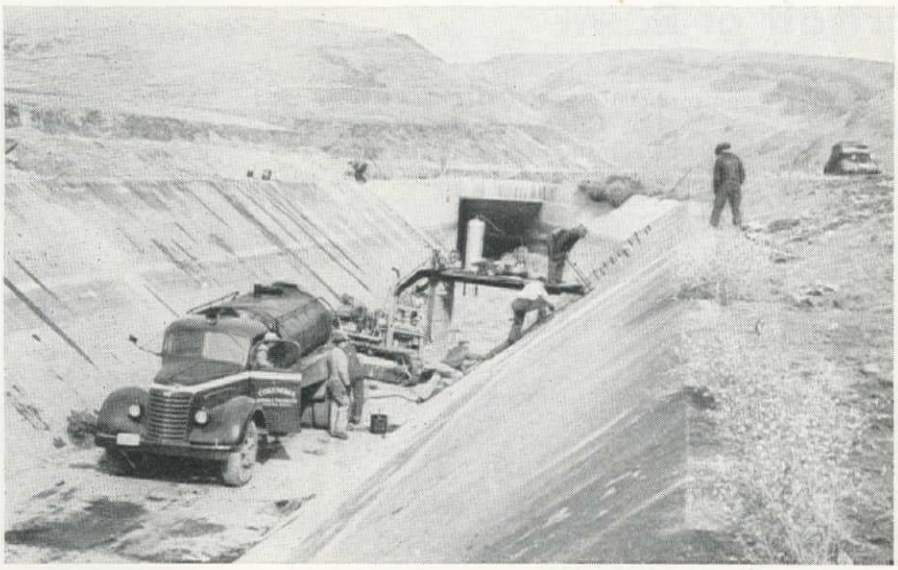
Poor foundation causes seepage

The latest use of the asphaltic sub-sealing technique was on 1,000 ft. of the Pamona Siphon, part of the Yakima Ridge Canal 8 mi. north of Yakima, Wash. This section of the canal, with a bottom width of 12 ft. and side slopes of 17 ft., was lined in 1937 and water was first turned into the canal in 1941. A volcanic basalt formation underlying the lining was apparently badly shattered during construction and seepage occurred through expansion joints when the canal was placed in service. An attempt was made to seal this section of the canal in 1945 with an application of asphaltic emulsion applied to the lining face, but without success. The Northern Pacific Railroad is located directly below the canal at this point, and continual seepage from the canal was of much concern to the railroad company. After the successful experience in undersealing at the Riverton project, Bureau of Reclamation engineers decided to seal off the water loss by the same method.

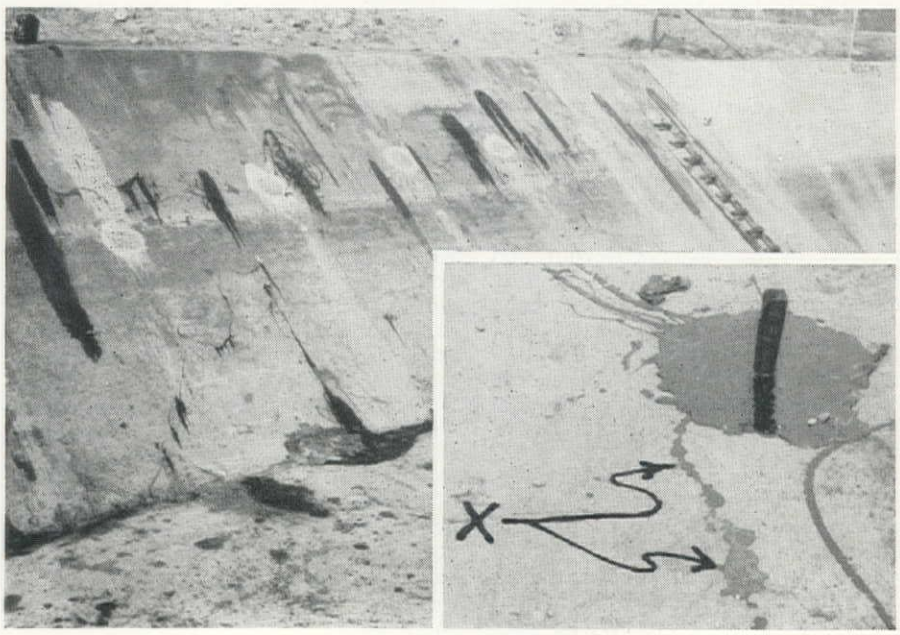
A contract was awarded Feb. 2, 1950, to the Columbia Asphalt Paving Co., Yakima, Wash., for the job. The contract was awarded on the basis of 26 cents per gal. for furnishing and applying sub-sealing asphalt as specified.



HOLES for application of asphalt on the canal's slopes were reached from a platform attached to a fork lift device mounted on a tractor. In this view, holes are being plugged.



OVERALL VIEW of the operation, above, showing outlet of Yakima River Siphon in background. Light spots on existing lining, below, are patches for filling test holes in which 30 cu. yd. of soil cement was poured prior to sub-sealing. The "X" at lower right indicates water that was forced up through a crack in the lining by pressure of the asphalt from below.



Application holes in lining

Holes for application of the asphalt were drilled by forces of the Bureau of Reclamation prior to award of the contract. The holes were drilled on a pattern of about 6-ft. centers and staggered to conform to the lining panels. Asphalt was first applied to holes along the bottom of the slope a distance of 200 to 300 ft. at a time, and this was followed by going back to the next row or two rows above the holes previously filled, and working the top rows last. Each side slope was completed prior to sub-sealing the bottom. A tractor equipped with a fork lift device to which was attached a platform was used for reaching the holes on the slope. (See illustration)

Pressure application

Asphalt was forced under the slab at temperatures from 325 to 350 deg. F. The material was an air-blown asphalt with a 50-60 penetration, a softening point of 140 to 175 deg. F., and a bitumen content of not less than 99%. A 1,250-gal. distributor and an asphalt gun were supplied by tank truck which hauled material the 8 mi. from Yakima, where tank cars at a railroad yard were heated with a locomotive using 110-lb. steam pressure. A 105-cu. ft. per min. compressor was used for blowing out the holes.

Use of asphalt above estimate

A total of 28,000 gal. of asphalt was used on the job, considerably more than the estimated 5,000 gal. Application was from 1 to 6 gal. per sq. yd. of lining, with the total job averaging about 5.5 gal. per sq. yd. An average of 1½ to 2-hr. time was consumed in emptying the distributor, with about 2 hr. lost between trips to and from Yakima for loading and hauling. An additional distributor was used during the last few days of the job to eliminate lost time of application.

NEWS OF WESTERN CONSTRUCTION

APRIL 15, 1950

Emergency Repairs to Tunnel Contracted Within One Week

THE BUREAU of Reclamation's engineering offices at Denver probably set a speed record last month for federal agency contract negotiations when it made an award for construction of an irrigation tunnel only 7 days after an emergency had arisen.

Tunnel No. 3 of the Grand Valley project in western Colorado, built in 1914, collapsed March 9 under the weight of an ancient landslide which had resumed movement. Some 30,000 ac. of orchards and truck crops are dependent on water moved through the tunnel. If a bypass tunnel could not be completed until July 1, the production loss would total an estimated $1,300,000—but the loss could be held to $200,000 provided water could be moved by June 1.

L. N. McClellan, chief engineer of the Bureau, ordered an all-out effort aimed at saving every possible day. By March 10, preliminary specifications had been assembled and issued, and telegrams were sent out to prospective contractors. Contractors inspected the tunnel March 13 and 14, and the next day were in Denver for a negotiation session. The award was made March 16, and by March 18 the contract holders had workmen on the job.

The Grafe-Callahan Construction Co. of Los Angeles and Rhoades-Shofner Construction Co. of Los Angeles received the contract under a bid of $609,800 and an offer to complete the work in 72 days.

The work consisted of boring a tunnel of horseshoe shape, 13 ft. in diameter, 2,245 ft. long. Boring will be from two points in the 7,293-ft. Tunnel No. 3. Excavation was estimated at 13,500 cu. yd., with some steel support and lagging required. Concrete lining will be installed next winter under separate contract.

The construction was scheduled for completion on May 28. Liquidated damages specified in the contract are unusually heavy because of the importance of the time element—$2,500 a day for the first five days, $5,000 a day for the next ten days, and $7,500 a day thereafter.

McClellan expressed the Bureau's gratification that the joint bid offering completion in the shortest time was also the lowest among four offers. He had been authorized to enter into a negotiated contract, obviating the need to accept the lowest bid. The usual Bureau of Reclamation period for advertising for bids was waived. Other contract conditions were the same as for contracts entered into under ordinary circumstances.

The speedy action was facilitated by several moves made in anticipation of contracting for bypass tunnel construction after the 1950 irrigating season. A repayment contract with the Grand Valley Water Users association, anticipating rehabilitation work, was rushed to completion when the old tunnel collapsed. Diamond drilling to establish geology behind the slide area had been started in January.

After lying dormant for many years, the slide began moving some months ago. Its sudden acceleration wiped out Bureau plans to do the tunneling later. The same earth movement several times interfered with nearby main line tracks of the Denver & Rio Grande Western railroad.

Gibbs & Hill Will Design Atomic Station Power Plant

SELECTION of Gibbs and Hill, Inc., New York and Los Angeles, to design major permanent power facilities for the Reactor Testing Station near Arco has been announced recently by L. E. Johnston, Manager, Idaho Operations Office, A.E.C. The firm will design a central substation, high-voltage distribution lines, individual substations at each reactor site and, in addition, will re-design

EMERGENCY construction of the tunnel (see above) was launched March 16 by the contract signing shown below. Inking the document is *L. N. McClellan*, USBR chief engineer. Flanking him are *Floyd Shofner*, left, president of Rhoades-Shofner Construction Co., and *Everett Seabury*, vice-president of Grafe-Callahan Construction Co. Standing, left to right, are *W. E. Blomgren*, assistant chief engineer; *W. H. Nalder*, chief designing engineer, and *Grant Bloodgood*, chief construction engineer, all of the Bureau.

the present Scoville substation, under a negotiated lump-sum contract with the Atomic Energy Commission.

Basic purpose of the electrical work will be to provide a central means of making power available to all reactor testing station installations, and of bringing power immediately to the experimental breeder reactor, the materials testing reactor, and central site facilities. Estimated construction cost is in excess of $1,000,000.

The work will be handled by the firm's Los Angeles office. Edward H. Anson, vice-president, will be in charge of the Idaho project.

$50,000,000 Improvements to Harbors In Alaska Recommended by Engineers

PLANS for the improvement of harbors and rivers in the south-central area of Alaska around Cook Inlet, estimated to cost approximately $50,000,000, have been favorably recommended by the North Pacific division office of the Corps of Engineers. A survey report, prepared by the Alaska district engineer, recommends hydroelectric power developments estimated to cost $45,654,000, navigation improvements totaling $4,400,000, and flood control work costing $46,000, plus additional sums for annual maintenance, in the area.

Part of a comprehensive investigation of the entire territory of Alaska by the Corps of Engineers, the present survey is an interim report covering the area draining into the tidal waters of Cook Inlet, an arm of the Gulf of Alaska. Anchorage, Alaska's largest and youngest city, is the area's population center.

Cook Inlet basin, and the Anchorage vicinity in particular, is the hub of the Alaska military defense system. The rapid growth of Anchorage is primarily due to the military construction program and the defense establishment. It is highly desirable, therefore, that development of the basic economy of this area be supported, the district engineer's report points out. The report adds that a self-sustaining economy through resource development would reduce the cost of maintaining an effective defense establishment in Alaska.

In the interest of hydroelectric power development designed to relieve a critical power shortage since establishment of the military base at Anchorage with its attendant population increases, and also to provide for continued growth in the region, the report recommends four projects as follows:

A low dam to be constructed near Eklutna Lake outlet providing regulatory storage, a tunnel and penstock leading to Knik River, and a power plant with an installed capacity of 31,800-kw. on Knik River, at a total estimated cost of $25,240 000.

An intake structure on Cooper Lake, a tunnel and penstock leading to Kenai Lake, and a power plant with an installed capacity of 8,900 kw. on Kenai Lake, estimated to cost $5,032,000.

An intake structure on Crescent Lake, a tunnel and penstock leading to Kenai Lake, and a power plant with an installed capacity of 9,500 kw. on Kenai Lake, estimated to cost $5,882,000.

Transmission facilities, switch yards, and substations necessary to interconnect the three power plants and to deliver electrical energy to load centers, estimated to cost $9,500,000.

In the interest of navigation, designed to reduce transportation costs by providing additional harbor facilities, and protected small boat basins for fishing and other small craft, the following projects are recommended:

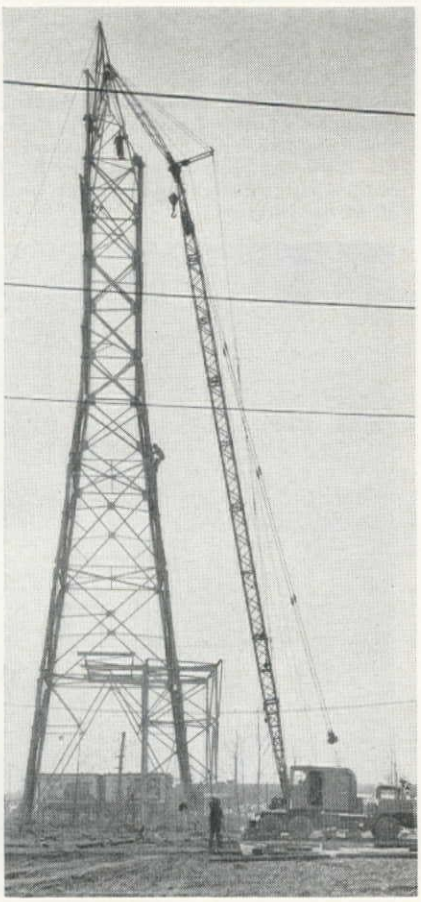
A deep water harbor at Anchorage consisting of a 1,420-ft. extension to the existing wharf with berthing facilities for four ships and dredging to provide a minimum depth of 35 ft. below mean low water adjacent to the wharf, costing $3,556,000 for construction and $150,000 annually for maintenance dredging.

A small boat basin in Seldovia bay 700 by 300 ft., dredged to a depth of 12 ft. below mean low water and protected by two rock breakwaters, at a total first cost to the Corps of Engineers of $364,700 plus $1,400 annually for maintenance.

A small boat harbor at Homer to be constructed by dredging a basin 400 feet by 300 feet at the end of Homer spit and protected by a rubble mound jetty, at an estimated first cost to the Corps of Engineers of $353,500.

A 120-FT. STRETCH

McRAE BROS. of Seattle, Wash., rigged a Lorain Moto-Crane with a 20-ft. extension on a 100-ft. boom to reach the top of a high tension tower in the City of Seattle Light department's plant yard.



$60,000,000 Tunnel Proposed for Trucks

DEVELOPMENT OF A $60,000,000 highway tunnel through the Tehachapi Mountains near Bakersfield, Calif., is being promoted by an association organized last month. Originally proposed by Cecil Dunn of Occidental College, the tunnel is planned to speed the delivery of farm produce and reduce traffic fatalities that now occur on winding mountain routes. The "Dunn plan" envisions two tunnels, one through the mountains from Castaic to the Antelope Valley, and the other from the Antelope Valley to a point near Grapevine at the San Joaquin Valley end of the Ridge Route. The tunnels would have two tiers, providing levels for both train and truck traffic. Automobile traffic would continue to use the Ridge Route.

Reports are that the plan has the approval of the Chamber of Commerce at Bakersfield, Kern County and Los Angeles. A $10,000 fund has been pledged to develop a brochure on the project for presentation to the California legislature. The legislature will be asked to create a San Joaquin Valley Authority similar to the agency that built the San Francisco-Oakland Bay Bridge.

$100,000,000 AEC Plans

AS A STEP to make the atomic weapons development center at Los Alamos, N. Mex., a permanent installation, it is estimated that $100,000,000 will be spent during the next six years for construction at the base. Present plans call for replacement of all wartime laboratories. The first major project under the program will be construction of a $12,000,000 laboratory building, for which bids will be opened about June 20.

Jobs for Civil Engineers

THE CIVIL Service Commission at Glendale, Calif., is currently seeking applicants for two top positions. One is for an immediate and permanent appointment as Glendale superintendent of water construction and operations—salary $465 to $581; requirements, 10 years of progressively responsible experience in water distribution work. The other is for the position of associate civil engineer, with a salary of $416 to $520 per month. Registry in the State of California is required. Glendale's Civil Service Commission is at 613 E. Broadway, that city. Filing is open to April 28.

A Busy Season at the Folsom Dam Project

A BUSY construction season is in store this year at Folsom Dam, on the American River near Fresno, Calif., a project planned to cost $50,000,000. The season will see many of the important preliminaries undertaken and finished. Bids were opened last month for a temporary tunnel diversion, work is already under way on administration buildings and the stripping of abutments in the river section, and two more bids are coming up soon. T. E. Connolly, Inc., of San Francisco, was awarded a $61,617 contract last month for the temporary tunnel to divert Natomas ditch flows around the dam site. L. S. Hawley and Hawley & Ramlose of Montebello, Calif., under a contract of $236,000, are cutting keyways into the abutments. W. C. Frye of Grass Valley, Calif., is the contractor for administration buildings.

The two calls for bids soon will be for construction of five right wing dikes to close saddles between the hills that extend in a northeasterly direction from the right end of the dam, and for the new Hinkle reservoir and temporary bypass to replace existing structures which will be affected by construction of the dam.

Keswick Dam on Sacramento River Officially Completed

KESWICK DAM, $10,800,000 structure on the Sacramento River 9 mi. downstream from Shasta Dam was officially completed March 31. The dam's primary function is to re-regulate flow of the Sacramento River which fluctuates greatly as it comes through Shasta's power plant. Another chief function is to create an additional supply of hydroelectric power through its own 3-generator power plant.

A total of 75,000 kw. will be generated at Keswick's power plant. About a fourth will be used to power the pumps at the Tracy Pumping Plant on the Delta-Mendota Canal; the remainder will be sold to cities, irrigation districts and other public bodies. The power plant, including switchyard, cost $11,200,000.

Los Angeles Needs Engineers

TWO POSITIONS are open with the Los Angeles County Flood Control District for civil engineers. Salaries begin at $395 and $417. The positions are open to persons with at least two years of college, engineering experience and a valid California State License. Applications are being accepted until May 5 at the office of the Los Angeles County Civil Service Commission.

OFFICES at Salt Lake City of the Intermountain Branch, Associated General Contractors of America, have been moved to 450 South Main St. (Old address, 224 Beason Bldg.).

SPACE-SAVING WAREHOUSE RACK USES 10-GAL. STEEL DRUMS

E. W. MORLEY, warehouse superintendent of the United States Steel Supply Co. in Los Angeles, had the problem of storing 190 different sizes of rivets in a limited space, so he developed a steel rack 8 ft. high and 23 ft. long with cross-pieces supporting platforms for steel drum containers. Each drum can contain about 275 large bolts or nuts, so the rack can store 25 tons of bolts and nuts in a space easily accessible.

USBR Will Invite Bids for Major Dam Projects During Next Two Months

A BID INVITATION will be issued April 28 by the Bureau of Reclamation for construction of Tiber Dam, an earthfill structure 200 ft. high and 4,250 ft. long on the Marias River about 13 mi. south of Chester, Mont. Involved in the contract will be 12,000,000 cu. yd. of excavation for the dam and dike, 7,000,000 cu. yd. of earthfill for the dam and dike, and 5,100,000 cu. yd. of sand, gravel and cobble fill in the dam embankment. A total of 1,200 days is allowed for completion of the project. Specifications and bid forms may be obtained from the Office of the Chief Engineer, Denver, Colo.

On April 27, bids will be invited for the construction of three 111-ft. bridges, each with three 37-ft. spans of steel beams and concrete decks, across the Coachella Canal near Yuma, Ariz.

Three canal jobs for which bid invitations will be issued this month are the following: Construction of 20 mi. of laterals and sublaterals on the Cambridge canal lateral system near Holbrook, Neb.; excavation of about 1 mi. of the Delta Cross Channel between Lock and Walnut Grove, Calif.; and construction of 69 mi. of concrete pipe lines for the Lindmore Irrigation District on the Friant-Kern Canal distribution system near Lindsay, Calif.

Bid invitations will be issued during the next two months for one concrete and four earthfill dams. They are as follows: Anchor Dam, a concrete arch structure 200 ft. high and 550 ft. long on

a tributary of the Big Horn River near Thermopolis, Wyo.; Cachuma Dam, an earthfill structure to be 216 ft. high and 2,900 ft. long and to involve an earth fill of nearly 7,000,000 cu. yd., on the Santa Ynez River near Santa Ynez, Calif.; Trenton Dam, a 5,400,000-cu. yd. earthfill structure 100 ft. high and 8,000 ft. long on the Republican River near Trenton, Neb.; Big Sandy Dam, an earthfill structure 70 ft. high and 2,300 ft. long on the Big Sandy Creek near Eden, Wyo.; and Carter Lake Dam, an offstream earthfill structure 180 ft. high near Berthoud, Colo.

Bids will be invited next month also for construction of a 23-mi. long concrete-lined section of the Friant-Kern Canal about 12 mi. from Bakersfield, Calif. The section includes the 300-ft. Poso Creek Siphon and two 200-ft. siphons, all 12- by 12-ft. reinforced concrete twin-barrel structures. Other canal projects up for bids soon are the following: Construction of a 17-mi. section of the Potholes East Canal on the Columbia Basin Project in Washington; construction of a 30-mi. unlined section of the Cambridge Canal near Arapahoe, Neb.; construction of 12 mi. of concrete-lined canal near Fort Sumner, N. Mex., and construction of an 8-mi. long partially lined canal on the Fort Sumner Project.

Bids Next Month for Chief Joseph Project

THE FIRST STAGE of construction on Chief Joseph Dam, $234,000,000 structure on the Columbia River in Washington, was put up for bid late last month and if an acceptable bid is received, construction will begin about May 15. The bid opening is scheduled for May 2. Principal items of work include excavation for the right abutment of the dam on the north bank of the Columbia, construction of approximately 2,000 lin. ft. of cofferdam, unwatering the cofferdam and construction of about 2,000 lin. ft. of rolled, impervious upstream blanket. The contract involves 1,250,000 cu. yd. of excavation. Completion date for the first stage construction is April, 1951. A complete review of the project was given on page 82 of the March *Western Construction News*.

British Columbia Plans 7-Year Highway Program

A $92,000,000 highway construction program for British Columbia to be spread over the next seven years and financed from revenue of the 3-cent portion of B. C. gasoline tax now earmarked for paving, has been approved. This will replace a three-year $30,000,000 plan outlined by the government at a previous session of its legislature. Legislation will authorize the use of the 3-cent portion of the 10-cent gasoline tax as security for loans to pay for the highway building project. The plan calls for allocation of $16,500,000 in 1950, $12,500,000 in each of the next five years, and the remaining $13,500,000 in 1956.

Contractor Competition Lowers Bids in Arizona

LOWER BIDS on Arizona highway projects have saved Arizona nearly $500,000 in recent months, according to W. C. Lefebvre, Arizona state highway engineer. During the last six months of 1949, contractors' bids averaged 11% under state estimates, and since Jan. 1, 1950, the average has been 17% lower. Cited as criteria of prevailing trends were two recent contract awards—one for the Phoenix-Rock Springs Road, 31% under estimates; the other for the Ehrenburg-Wickenburg Road, 28% below estimates. According to Lefebvre, a greatly increased number of bidders on nearly all jobs is partially responsible for the downward trend in road construction costs.

Bids for Colorado Road Jobs Are Below Estimates

BRISK COMPETITION among contractors is keeping bids for highway jobs in Colorado well below the engineers' estimates, according to Mark U. Watrous, Colorado state highway engineer. Cited as an example was the award of a contract last month to the Northwestern Engineering Co. of Denver at $116,627, which was 14% below the department's estimate.

Asphalt Institute Sponsors Meetings on Canal Linings

THE ASPHALT INSTITUTE is sponsoring two meetings this month, at Phoenix, Ariz., and Calexico, Calif., to provide the opportunity for discussion of methods of preventing erosion and seepage losses by the use of low cost asphaltic canal linings. The meeting in Phoenix is on April 19, at the Westward Ho Hotel. That in Calexico is on April 20, at the Hotel De Naza.

At both meetings J. R. Benson, engineer with the Bureau of Reclamation will discuss buried asphaltic membrane linings; W. F. Winters, District Engineer at Denver for the institute will review the use of prefabricated asphalt linings, and C. V. Kiefer, of Shell Oil Co. will discuss asphaltic concrete canal linings. A field trip is planned during each meeting for demonstration of a slip form laying an asphaltic concrete lining.

Sponsors of the Asphalt Institute are the General Petroleum Corp., The Petrol Corp., Shell Oil Co., Stancal Asphalt and Bitumuls Co., and the Union Oil Co. of California.

Engineers Propose Flood Control in Nevada Valley

A FLOOD control project in the Moapa Valley of Nevada, to cost about $2,000,000, has been proposed by the Corps of Engineers, with the approval of the Departments of Interior and Agriculture. The project includes construction of two dams, Pine Canyon on the Meadow Valley Wash and Mathews on the lower Muddy River.

Nevada State Engineer Alfred M. Smith, in a letter of approval accompanying the Corps of Engineers' recommendation as forwarded to Congress, said the project would relieve the fear of floods along both streams, which are tributaries of the Virgin River. The towns of Pioche and Caliente are located in the Moapa Valley, which is a productive mining area.

Congress on Large Dams Planning 1951 Convention

THE FOURTH CONGRESS on Large Dams will be held January 10-15, 1951, at New Delhi, India. In New Delhi at the same time will be held the Sectional Meeting of the World Power Conference. The Congress, sponsored by the International Commission on Large Dams, promotes research and collects experience in regard to technical problems connected with the design, construction, maintenance and operation of large dams. So far, 23 countries have joined the Commission. The last Congress was held in Stockholm, Sweden, in 1948.

Four questions will be dealt with at the forthcoming Congress. They concern methods of design, construction of earth dams, sedimentation of reservoirs, and properties of concrete. Each country will submit papers on the questions, and these will be discussed at the Congress meetings.

Gail A. Hathaway, Office of the Chief of Engineers, Department of the Army, Washington, D. C., is executive chairman of the U. S. Committee on Large Dams. Headquarters for the U. S. Committee is 4316 Van Buren St., Hyattsville, Mo.

Australia Asks Westerners For Bids on Large Earth Dam

THE AUSTRALIAN government is asking Western contractors to present bids on a dam to be constructed in Victoria. The earth dam, to contain about 13,000,000 cu. yd. of earth and rock fill, is known as the "Big Eildon" and will be built below the site of the present Eildon embankment on the Goulborn River about 90 mi. northeast of Melbourne, Australia.

The "Big Eildon" will have a reservoir capacity of 2,750,000 ac. ft., and the dam will have a height of 260 ft. About 300,000 cu. yd. of concrete work will be involved.

OKLAHOMA is facing the expense of more than $59,000,000 in the replacement of 1,051 sub-standard bridges, according to state highway director, H. E. Bailey. A survey recently completed for the state highway commission discloses the structures are located in all but one of the state's 77 counties.

Research Develops a Lightweight Aggregate

RESEARCH at the engineering experiment station of the University of Washington has resulted in the utilization of Washington shales and clay for a new-type lightweight aggregate. Local clays are heated to a plastic stage and gasses from an additional ingredient cause each grain to expand and form bubbles. The bubbles maintain their shape as the aggregate is cooled, and then can be mixed with cement. According to Dr. Peter D. Johnson of the department of mineral engineering, the aggregate will be cheap, strong, waterproof, light and have good insulation qualities.

Bids for $5,000,000 Garage

BIDS will be re-opened May 25 for construction of the $5,000,000 underground garage at downtown Pershing Square in Los Angeles. No bids were received at an earlier bid opening in January. However, five concerns asked for another opportunity to bid on the project.

Low Whistles Greet Bid At 50% of the Estimate

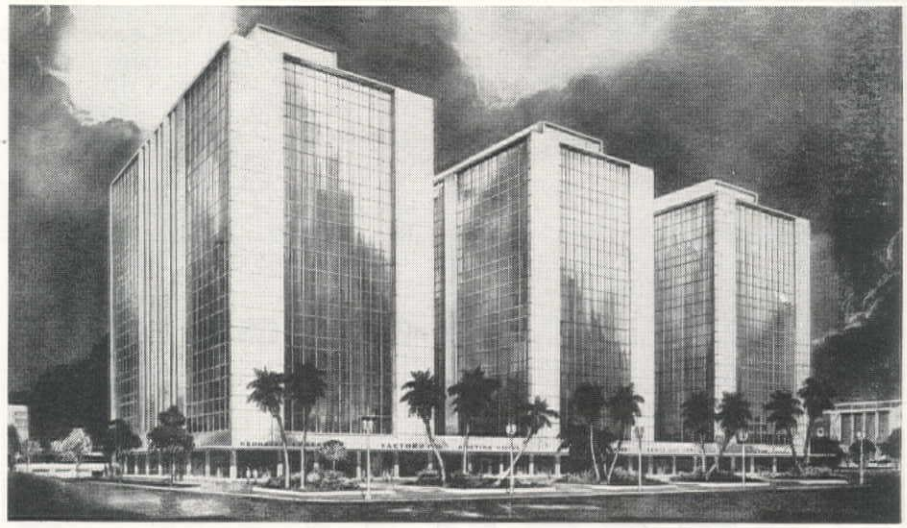
LOW WHISTLES and head shakings greeted the bid openings last month at the Sacramento offices of the Corps of Engineers when H. Earl Parker, Inc., of Marysville, Calif., was $92,000 lower than his nearest competitor with a bid of $122,009. The bid was for clearing and channel improvement work on a 14-mi. stretch along lower Butte Creek where it forms the boundary between Glenn and Butte Counties. Next in line was the M. A. Jenkins company of Sacramento with a bid of $214,527. Engineer's estimate was $186,790.

Coronado Approves Tube

THE RESIDENTS of Coronado, Calif., across the bay from San Diego, have approved construction of an $8,000,000 toll tube under the bay to replace the present ferry system. In a unique poll whereby each resident in Coronado received a questionnaire, more than 70% favored the construction. Formation of a toll tube authority to amortize the cost of the tunnel is being considered.

Northwest Engineers Will Hold 2nd Annual Meeting

THE PACIFIC Northwest Conference of the American Society of Civil Engineers will hold its second annual meeting in Tacoma, Wash., May 5-6. The conference was organized in 1948 as a coordinating agency for the Pacific Northwest Sections of ASCE, and to give them a means of discussing matters of common interest. The Tacoma Section is playing host to the conference this year. Professional registration, engineering education and problems of Tacoma Narrows bridge construction will be major topics of discussion. A field trip will be made to the Tacoma Narrows Bridge site. John Stackhouse of the Washington State Highway Department is chairman of the conference, and Thomas H. Campbell of the University of Washington is vice-chairman.



$12,000,000 GROUP OF OFFICE BUILDINGS PLANNED AT LOS ANGELES

THREE height-limit air-conditioned office buildings will be built immediately on Wilshire Blvd. in Los Angeles by the Tishman Realty and Construction Co. Each of the buildings will cover a plot measuring 100 by 150 ft., and all three will be connected by a common first floor. Three-quarters of the outside area will be in glass.

Concrete Pipe Industry Affiliates Trade Groups

AT THE RECENT concrete pipe industry convention held in San Francisco, the newly-formed American Concrete Pressure Pipe Association (organized in 1949) affiliated with the 43-year old American Concrete Pipe Association. The pressure pipe group was organized in 1949 as a trade association to promote the interests of the concrete pressure pipe industry. The older organization has always devoted its activities to the fields of concrete sewer and culvert and concrete irrigation and drain tile promotion. The two will now coordinate activities as "Concrete Pipe Associations, Inc.," and will headquarter at the Builders Bldg., Chicago, Ill., under the direction of Howard F. Peckworth as managing director of all three organizations.

FPC Reviews Progress In 29th Annual Report

THE FEDERAL Power Commission has issued its twenty-ninth annual report covering the fiscal year ended June 30, 1949.

The report, which presents for Congress and the public a background on Commission activities during the fiscal period, reviews FPC functions in connection with natural gas, electric power, rate regulation, corporate regulation, licensing of hydroelectric projects, accounting, river basin surveys and power requirement studies. Copies of the report may be obtained from the Publications Section, Federal Power Commission, Washington 25, D. C., at 35 cents each. Order number is FPC-A-37.

Contracts Soon for Forest Highway Projects in the Northwest States

THE FOREST HIGHWAY program in Oregon, Montana, Washington and Idaho has been agreed to by the state highway departments, the U. S. Forest Service and the Bureau of Public Roads, according to W. H. Lynch, Division Engineer for BPR at Portland. Contract awards for the group of jobs are being handled directly from BPR offices at Portland. A number of large projects in the group will be up for bids soon. Among them are the following:

Oregon — Grading and bituminous surfacing 2.4 mi. of the Pacific highway near Canyonville, estimated cost $1,011,000; grading and ballasting 2.9 mi. of the north Santiam highway, the upper end of the highway relocation at Detroit Dam, $425,000 (bids in May); bituminous surfacing of 18.2 mi. of the Ochoco highway near Prineville, $400,000; bituminous surfacing of 10.4 mi. of the Alsea highway near Waldport, $300,000; bituminous surfacing of 3.6 mi. of the Pendleton-John Day highway, $340,000; grading 3.9 mi. and bituminous surfacing 12.3 mi. of the John Day-Burns highway, $400,000, and grading 6.5 mi. of the North Umpqua highway near Roseburg, $750,000.

Montana—Grading 5.8 mi. of the Columbia Falls-Glacier Park highway near West Glacier, $850,000; grading 8 mi. of the Swan River highway near Big Fork, $355,000; grading 6.0 mi. of the Lewis & Clark highway near Lolo Hot Springs, $375,000, and grading 6.0 mi. of the West Gallatin highway near Karst's Camp, $200,000.

Washington — Bituminous surfacing 12.3 mi. of the Randle-Yakima highway near Packwood, $390,000; grading 5.2 mi. of the Republic-Kettle Falls highway, $300,000 (June 15); bituminous surfacing 15.6 mi. of the Loup Loup highway near Twisp, $235,000, and bituminous surfacing 7.6 mi. of the South Fork-Stillaquamish highway near Granite Falls, $215,000.

Idaho—Bridge construction and 9.4 mi. of grading on the Ketchum-Clayton highway, $680,000; grading and bridge construction south of Pritchard, $400,000; grading and bridge construction on 5.4 mi. of the Coolin-Dickensheet Junction road, $325,000; grading 6.0 mi. on the McCall-Stibnite road, $300,000, and bituminous surfacing of 1 mi. of the Banks-Lowman road near Garden Valley, $185,000.

Griffith Chart

. . . Continued from page 98

weather to be figured as walls.

Floors and ceilings exposed to unheated rooms figured as ½ walls.

Plastered ceilings with unheated air space above figured as ½ wall.

Ceilings plastered on roof joists figured as exposed walls.

Figure bathrooms for 80°F.

Add 15% for each fireplace not provided with damper.

Add 30% for radiation under seats (unless convection heaters are used).

Add 20% for radiators on inside walls in an exposed room.

Triple contents for stores, lobbies, or rooms where outside doors are opened frequently.

For indirect radiation, add 75%.

Used by permission of The Trane Company, La Crosse, Wis.

PERSONALLY SPEAKING

George M. Garrett, with the Texas State Highway Department since 1924 and district engineer of the Fort Worth District since 1945, has been named deputy state highway engineer. W. W. Finley, formerly assistant to Garrett, moves up to succeed him. Finley had been assistant district engineer at Fort Worth since 1928.

* * *

Ray J. Lyman has been named project manager of the Tucumcari, New Mexico, irrigation project of the Bureau of Reclamation. He has served as project superintendent since 1947, and most recently as acting project engineer in charge of construction. Construction of the 43,000-ac. project was completed recently.

* * *

L. W. Irwin, formerly project manager for the Arundel Corp. and L. E. Dixon Co. on construction of the Toketee Falls hydroelectric development on the North Umpqua River for the California-Oregon Power Co., is now director of research and development for the American Pipe & Construction Co., Los Angeles, Calif.

* * *

Appointed to the small projects committee of the National Reclamation Association, Washington, D. C., are the following men: **John Bliss,** Santa Fe, N. Mex.; **Dr. Porter E. Ahrens,** Scandia, Kansas; **Fred E. Buck,** Helena, Mont.; **Raymond F. Lund,** Rapid City, S. Dak.; **Hugh A. Shamberger,** Carson City, Nev.; **Francis Wilson,** Ardmore, Okla., and **T. W. Jensen,** Mt. Pleasant, Utah. The committee will advise on small projects for the development and conservation of water resources of the West.

* * *

Kenneth P. Norrie and **L. C. Campbell,** consulting engineers of Spokane, Wash., have formed a partnership in a firm to be known as Norrie & Campbell, with offices in the Realty Building, Spokane. Norrie was with the Seabees in the Pacific during the war, has worked on dam design and flood control studies for the Corps of Engineers, and helped design the Lake Washington pontoon bridge at Seattle. Recently, he handled the structural design work for two $1,500,000 buildings at the University of Washington, and two structures at the University of Idaho. Campbell has been employed by the Burns & McDonnell Engineering Co., the Fluor Corp., Henry George & Sons and Whitehouse & Price.

* * *

TREXEL

Rear Admiral Carl A. Trexel, Civil Engineer Corps, USN, retired April 1 at his own request after 33 years in the Navy to take a position as executive manager for International Marine Platform Constructors of San Francisco. His most recent duty with the Navy was as Director of the Pacific and Alaskan divisions with headquarters in San Francisco. In this capacity, he has had cognizance of the petroleum exploration operations being conducted by the Navy in Arctic Alaska near Point Barrow. International Marine Platform Constructors, which Trexel is joining, is a joint-venture firm organized by Ben C. Gerwick, Inc., San Francisco, and Stolte, Inc., Oakland, heavy marine and general contractors, to construct offshore marine platforms for oil drilling and other purposes.

* * *

Henry B. Taliaferro has been named regional power manager of the Bureau of Reclamation, Region 2, with headquarters at Sacramento, Calif. The appointment fills the vacancy left when former power manager **Ben W. Creim** went to Washington, D. C. to become administrator of the Southwestern Power Administration. Taliaferro has been Creim's assistant at Sacramento since the war. He was formerly office engineer to the chief of construction at Bonneville Power Administration in Portland, Ore., and later was assistant in the Washington office of BPA.

* * *

Under a new law passed by a special session of the Idaho state legislature, **J. R. McKinney,** formerly Idaho commissioner of public works, becomes Idaho commissioner of highways, and **James Reid,** formerly director of the Idaho Bureau of Highways, becomes chief engineer of the highway department. Changes are in title only and no change has yet been made in method of operation of the Idaho highway department.

* * *

J. P. Yates, vice-president in charge of the engineering division of Bechtel Corp. at San Francisco, has announced two new assignments in the Bechtel organization. **Russell B. Johnson** will serve as assistant chief refinery engineer under **Fred Meyer,** and **Robert S. Custer** has been assigned as assistant chief process engineer under **Gordon Zimmerman.** Johnson has been with the firm for seven years, and during that time has handled several large projects within the engineering group. Custer, with the Bechtel engineering process group for the past two years, has had a hand in the process work for most of the recent refinery projects of the division.

* * *

W. S. Jackson has resigned as city engineer at Nelson, B. C., a post he held for the past year.

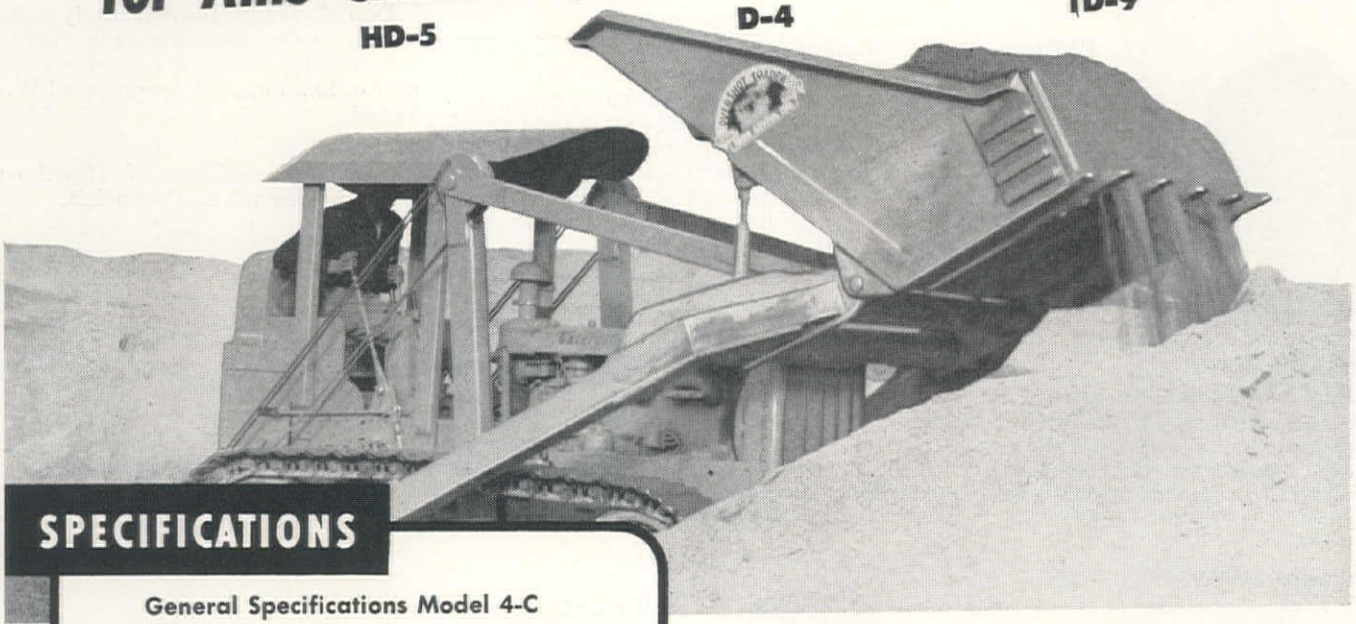
* * *

Stanley A. Kerr has retired as regional planning engineer at the Sacramento office of the Bureau of Reclamation. Of his 29 years in government reclamation work, Kerr has spent the last 9 years in Sacramento in charge of general investigations of the water resources of California's Central Valley Basin, the Klamath Basin of Oregon and California, as well as the adjacent coastal and mountain areas. Under his supervision, the Bureau prepared the monumental

Now...a Utility Size Overshot Loader

for Allis Chalmers, Caterpillar, International

HD-5 D-4 TD-9



SPECIFICATIONS

General Specifications Model 4-C

Standard Bucket Capacity in cubic yards (rated)	1
Bucket width	5′
Number of bucket teeth	5
Overall width	7′-6″
Dumping clearance	8′
†Overall height (bucket lowered)	7′-8″
Overall height (bucket raised) standard machine	15′-3″
Overall height (bucket raised) underground mining	12′
Overall length (bucket lowered)	17′
Cable diameters	½″
Loading cycle (seconds)	20
Weight (approx. lbs.)	7,000
Cubic displacement for export	303 cu. ft.

†With bucket lowered, the 4-C Austin Loader will clear low underpasses when loaded on a trailer.

*F. O. B. Denver price, Austin 4-C Overshot Loader, $3880.00.

A $3,800* LOADER THAT DOES THE WORK OF AN $18,000 MACHINE!

You can handle stock pile and loose bank material at lower cost than ever before and save expensive equipment for other duty. The Austin 4-C Overshot Loader handles 125 yards per hour on a 50-minute hour. Overshot loading eliminates swinging and blocking, permits the 20-second loading cycle.

You'll find fuel consumption is about the same as for normal dozing operations. Operation is simple, with a single control lever, allowing operation of both loader and tractor at the same time. The single cable power system is driven by a Caterpillar Model 24 Cable Control Unit operating through a special wrap-around series of sheaves. This gives even tension at both sides, maximum power at the start of the loading cycle, and maximum speed for the balance of the cycle.

Make your tractor a one-man machine for loading, cleaning, sweeping, and excavating. It has a place in any operation.

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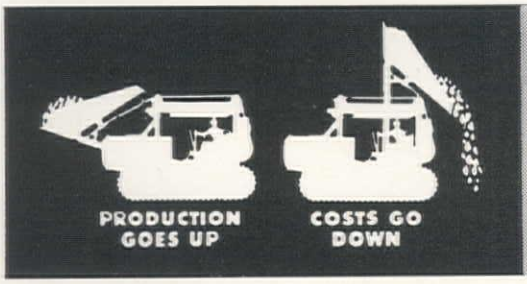

John Austin, Inc.

DENVER 2, COLORADO

Central Valley Basin Report, just published. Other than government service, Kerr has been city engineer for Inglewood, Calif. (1925), and on the staff of J. P. Lippincott, consulting engineer of Los Angeles (to 1939). Pending permanent appointment of a successor to Kerr, **Richard P. Bryan** has been named acting regional planning engineer. Bryan has been Kerr's assistant for the past decade.

* * *

L. E. Weckerling is now office engineer for the Bureau of Reclamation on the Fort Sumner Project in New Mexico. He was formerly a field engineer on the Tucumcari Project in New Mexico for the Bureau.

* * *

R. J. McMullen, formerly superintendent of irrigation, has been named manager of the Salt River Valley Water Users' Association in Arizona. He succeeds **O. L. Norman,** who resigned March 17.

* * *

Chester W. Shelley of Florence, Ariz., has been named city manager of Las Vegas, Nevada.

* * *

John A. Beemer, retired Bureau of Reclamation engineer who pioneered in irrigation development and specialized in big dam construction in the West during 36 years of public service, has been nominated by Commissioner Michael W. Straus for a place of honor in Reclamation's Hall of Fame.

* * *

Francis M. Compton, civil engineer of Salt Lake City, Utah, has been named to the Utah State Health Department to work on stream pollution problems.

* * *

John C. Page, retired commissioner of the Bureau of Reclamation, received on March 20 the Department of the Interior's highest honor, the Distinguished Service Award. The gold medal and citations were presented to him by the Bureau's chief engineer, **L. N. McClellan.** Page was commissioner from 1937 to 1943, and a Bureau consulting engineer until 1947. Earlier of his 36 years of Bureau service were spent on the Grand Valley and Boulder Canyon projects.

* * *

Eight employees of the Portland District, Corps of Engineers, have received money awards for submitting suggestions which will save funds of the federal government. Largest award of $75 went to **George Lautman** and **Raymond K. Wright,** employees at Bonneville Dam, who suggested standardization of seals on spillways and powerhouse gates and stoplogs at the Corps of Engineers' hydroelectric plant on the Columbia River. Others on the award list are **Elton O. Reed,** master of the dredge *Multnomah*; **Harold M. Robert** at Bonneville Dam; **Benjamin F. Lamar** at Willamette Falls Locks; **Jesslyn C. Struble** at Bonneville Dam; **Irene F. Kelly,** employee of the design branch at Portland, and **Albert L. Cox,** planning branch employee at Portland.

* * *

Victor C. Szczepkowski, recently with Stone & Webster Engineering Corp., Los Angeles, is now assistant planning engineer for Ventura County, Calif., with headquarters at Ventura.

* * *

Perley M. Lewis, who has been in charge of the expansion of the city water system of Phoenix, Ariz., has been named by City Engineer **R. Gail Baker** to be in charge of the Phoenix water department.

* * *

Francis J. Nettleton, assistant engineer on highway planning for the Kansas state highway department, is the 1950 president of the Kansas Section, American Society of Civil Engineers, succeeding **Reed F. Morse. D. D. Haines** is vice-president and **John Frazier** is the re-elected secretary.

* * *

Axel Persson, manager of the Lower Yellowstone project with headquarters at Sidney, Mont., has resigned after 33 years at that post to accept employment with Bureau of Reclamation at Billings, Mont., as regional chief of irrigation operation, Region 6. Persson worked with the bureau from 1917 to 1932, and then was retained by the irrigation districts which took over operation of the Lower Yellowstone project from the Bureau of Reclamation. He was appointed manager of the project in 1933. **Emmett M. Gardner,** who was employed on the project in 1948, succeeds Persson. Previous to 1948, Gardner was employed on the Buffalo Rapids project in Montana for five years as operation and maintenance superintendent.

* * *

Clair A. Hill, formerly consulting engineer at Redding, Calif., has succeeded **W. W. Green** as city engineer of Redding.

* * *

Don C. Davis, until recently associated with Quinton Engineers, Ltd., of Los Angeles, has been named city engineer of Banning, Calif., to succeed **W. H. Wood.**

* * *

New city engineer of Hawthorne, Calif., is **Bernard L. Prenovich.**

* * *

Lt. Col. George A. Finley, Corps of Engineers, has been assigned as executive officer to work with **Col. Donald S. Burns,** Portland District Engineer. Colonel Finley comes to the Portland office from Norfolk, Va.

* * *

W. C. Anderson has taken over the post of city manager of Las Vegas, Nev., following the resignation of **George Treem.** He will continue to serve as city engineer, the position he has held since last November.

* * *

Ranney Y. Lyman, assistant regional chief of engineering for the Bureau of Land Management at Billings, Mont., retired March 1 after 50 years of service surveying public lands.

* * *

Julius Irion, county engineer of Maricopa County, Ariz., resigned last month. He was appointed to the job in January of 1948, and had served two previous terms in the position, the first starting in 1935.

* * *

O. F. Cooley, 67, Los Angeles county road commissioner who has served the Los Angeles county department continuously for the last 37 years, retired March 2. He directed construction of nearly 5,000 mi. of county roads since 1913, and was co-designer of the Colorado Street Bridge.

* * *

W. P. Cornelius, chief of the construction and maintenance division at the Hanford Atomic Works, Richland, Wash., has resigned to accept a position with a private engineering firm in Texas. He came to Richland in 1941 from the Oak Ridge, Tenn., atomic plant.

* * *

V. H. Todd, Sr., Portland, Ore., is now concrete form detailer for L. H. Hoffman, Portland contractor, on construction of Portland's sewage treatment plant.

* * *

Walter Ryan, consulting civil engineer, is the 1950 president of the Tacoma Engineers Club, Wash. Vice-presidents are **Clyde Murray** and **Walter Gordon.**

THE IDAHO Society of Professional Engineers recently presented a certificate conferring an honorary life membership in the Society to H. W. MORRISON, left, president of the Morrison-Knudsen Co., Inc., Boise. ORLAND C. MAYER of Boise, 1949 president of the Society, made the presentation of the certificate at the banquet which concluded the organization's 1950 meeting.

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BITUMULS was the **answer.** It mixed easily with the wet existing sand, and cured in record time — Vital factors in repulsing Jap bombers.

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"Pave 1,700,000 sq. yds. of parking area for carrier planes. No local crushed aggregate available. The cost must be **low.**"

BITUMULS was again the answer. Nine Million Gallons stabilized 350 Acres of local sand—6" Deep. Conventional pavement would have required over **600 trainloads** of imported aggregate—at about three times the cost.

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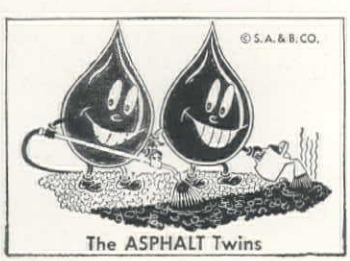

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E. Providence 14, R. I. • San Juan 23, P. R. • Mobile, Ala.

Lewis Jeklin is secretary-treasurer and **David Countryman** is chairman of the executive committee.

SMITH

Dr. Ralph J. Smith, head of the engineering department of San Jose State College, has been elected president of the Engineers Club of San Jose to succeed **George H. Ballantyne,** consulting engineer. **Roy M. Magnuson** was elected vice-president and **J. Robert Roll** was named secretary-treasurer.

REED

O. P. Reed, superintendent of electric and gas distribution for the Cheyenne Light, Fuel and Power Co., is the newly-elected 1950 president of the Wyoming Engineering Society. Other new officers are: **I. J. Mathews,** district engineer of the North Platte District for the Bureau of Reclamation at Casper, vice-president, and **Kirby H. Olds,** designer for the Wyoming Highway Department at Cheyenne, re-elected secretary-treasurer.

JANSSEN

Allen S. Janssen, Dean of Engineering at the University of Idaho, Moscow, is the 1950 president of the Idaho Society of Professional Engineers. **Howard R. Flint,** sales manager for Armco Drainage and Metal Productions Co., Pocatello, is vice-president; **Archie L. Biladeau,** sanitary engineer with the Idaho State Department of Public Health is treasurer, and **James L. Morris,** city engineer of Boise, is secretary.

At the 47th annual meeting of the American Road Builders' Association, held in Cincinnati, Ohio, March 6-9, **Colonel Enoch R. Needles,** Summit, N. J., of the consulting firm of Howard, Needles, Tammen and Bergendoff, was named ARBA President for a second term, and **T. E. Stanton,** Materials and Research Engineer with the California Department of Public Works, Sacramento, was elected to serve as Vice-President, Western District. Westerners named to serve on the ARBA County Highway Officials' Division included **Howard L. Way,** San Bernardino County Road Commissioner, Calif., President; **Chris P. Fauerso,** Wasco County Roadmaster, Ore., Western District Vice-President; **Manton Hannah,** McLennan County Engineer, Texas, Director, and **H. O. Walberg,** Skagit County Engineer, Wash., Director. **Walter N. Frickstad,** Engineering Consultant to the Alameda County Highway Department, Calif., and retired Superintendent of Streets of Oakland, Calif., is Western District Vice-President of the Municipal Division. Other Western engineers in this division include **L. G. Apperson,** City Engineer, Portland, Ore., and **J. W. A. Bollong,** Traffic Engineer, Seattle, Wash. Western vice-presidents of the Airport Division include **J. D. Ramsey,** Director of the Nebraska Aeronautics Commission, Lincoln; **O. J. Porter,** Consulting Engineer, Sacramento, Calif., and **Frank W. Wiley,** Director of the Montana Aeronautics Commission, Helena, Mont. Directors of this division, in the West, include **A. W. Meadows,** Director, Texas Aeronautics Commission, Houston; **Joseph Bergin,** Salt Lake City, Utah, Advisor to the National Commander, Civil Air Patrol, and **Chet Moulton,** Director of the Idaho Bureau of Aeronautics, Boise. **Charles M. Upham,** Engineer-Director of the ARBA since 1926, retired from that position. It was announced at the meeting that Upham, an internationally known road authority, will continue to serve the ARBA as a consultant, actively assisting in its policies and program.

OBITUARIES . . .

William Tefft Haight, 57, Senior Bridge Engineer with the California Division of Highways, died Feb. 26 at Glendale, Calif. After nine years of experience in the East, he came to Los Angeles and spent nine years in private engineering and contracting practice and then a year as construction engineer with the U. S. Forest Service. From 1933 to 1936 he was on the construction of the San Francisco-Oakland Bay Bridge, followed by four years on bridge construction in Southern California with the Division of Highways. During the last war, he was in responsible charge of all engineering work connected with airports of the 4th Air Force Area. Discharged for disability in 1946, he returned to the Bridge Department of the Division of Highways, where he was in direct charge of construction of many bridges in Southern California.

Carl L. Randolph, retired civil engineer of Arcadia, Calif., and formerly an engineer for Los Angeles County, died last month.

William Percey Havenor, 72, county surveyor of Bannock County, Idaho, since 1927, died March 9. A veteran among Idaho's county officials, Havenor came to Pocatello in 1902. He served as assistant civil engineer for the Union Pacific Railroad from 1903 to 1905. He and S. E. Anderson operated the Bannock Engineering Co. from 1905 to 1923 in Hailey and Pocatello. From 1907 to 1909, he was Pocatello city engineer. He served as Bannock county surveyor from 1917 to 1920, in 1923-4, and continuously since 1927. He was also county highway supervisor.

Charles Herbert Blake, 68, building contractor of Los Angeles, died March 9.

Albert DuBois, 84, retired building contractor of Beverly Hills, Calif., died March 12.

John W. White of Bulkhead City, Ariz., a rigger for Macco Corp., died recently.

William Elwood Lamborn, 53, died suddenly on March 12 at the Bureau of Public Roads construction project near Canyonville, Ore. He had been employed as an engineering assistant with the Bureau of Public Roads in the northwest states for the last 18 years except for some service with the Navy. He had also worked for BPR in Panama and on the Alaska Highway.

Lowell R. "Jack" Enos, construction foreman at the Spokane, Wash., air force base, died March 2.

Antonio Charvella of Grandview, Wash., an employee of McNary Dam Contractors on construction of McNary Dam near Umatilla, Wash., was killed March 4 when a temporary hopper for handling concrete collapsed.

Harry William Baum, 75, construction engineer who supervised construction of state capitol buildings at Boise, Idaho; Salt Lake City, Utah, and Oklahoma City, died March 3 at Pasadena, Calif.

Herman Carlson, 71, building contractor of Billings, Mont., since 1917, died March 3.

Walter W. White, 84, retired building contractor of Los Angeles, died recently.

Seth F. Michael, 68, retired civil engineer employee of the Portland District, Corps of Engineers, died March 22. After nearly 40 years of service with the Corps of Engineers, he had retired on February 1 of this year. He had served as resident engineer in charge of all maintenance dredging on the Columbia and Lower Willamette Rivers. Before coming to the Army Engineers, he had been resident engineer for the Spokane, Portland & Seattle Railroad at Portland.

John J. Welty, 84, retired building contractor of Phoenix, Ariz., died March 18.

Harry B. Newton, 70, building contractor of Los Angeles, died March 20.

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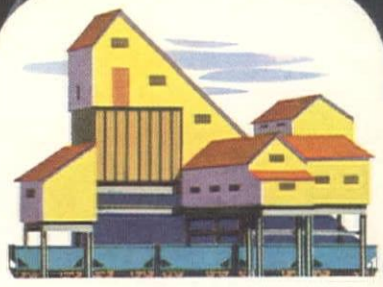
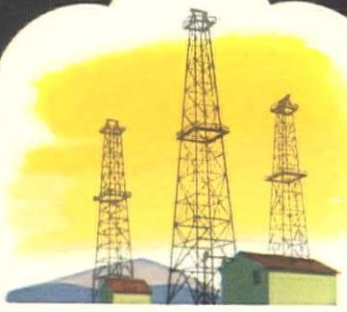


MINING



PETROLEUM

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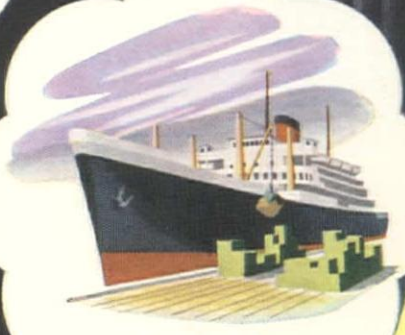

MARINE

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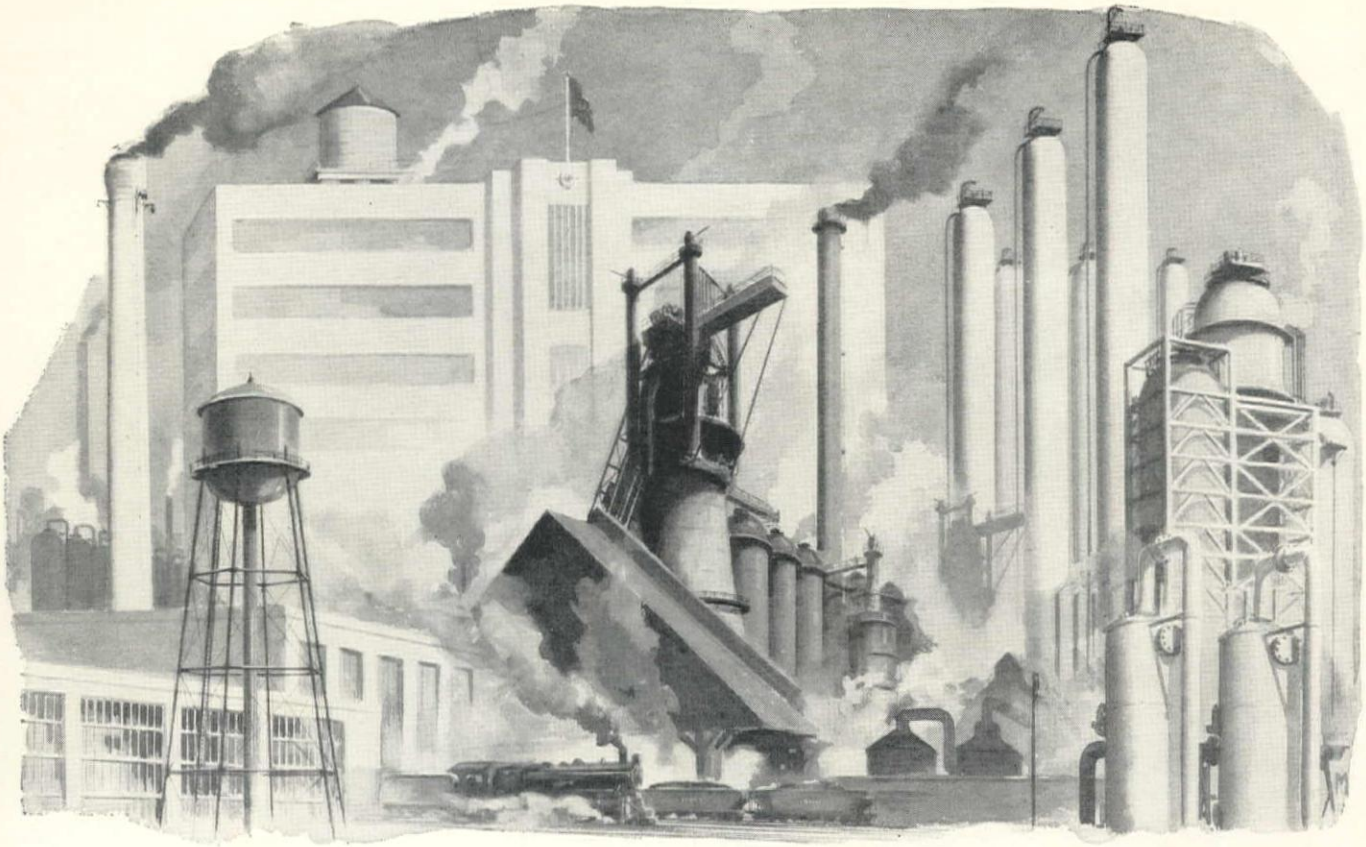

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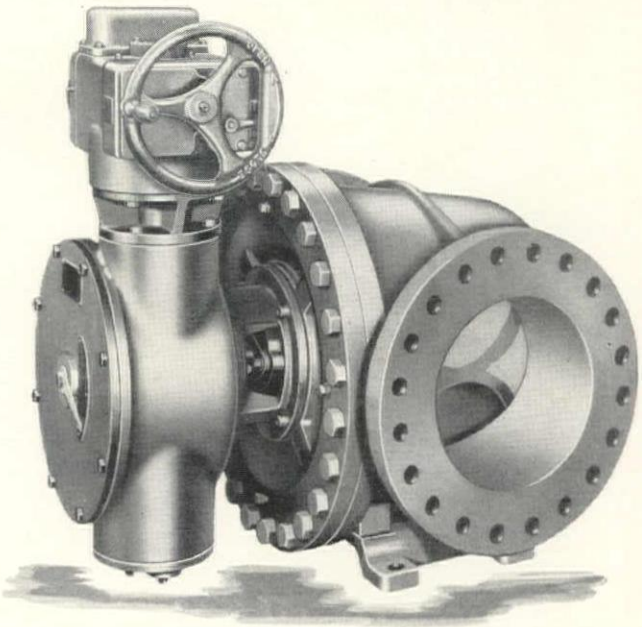

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SUPERVISING THE JOBS

B. A. Peters is managing the emergency repair of the Grand Valley Water Users' Association's irrigation tunnel No. 3 in western Colorado under a $609,800 contract awarded March 16 by the Bureau of Reclamation to the Grafe-Callahan Construction Co. of Los Angeles, and Rhoades-Shofner Construction Co. of Los Angeles. The contract for the project was awarded six days after specifications were issued, and seven days after the tunnel collapsed (see news item this issue). **Ray Blasongame** is the tunnel superintendent. Construction engineer for the Bureau is **R. D. Billings.** The project must be completed by June 1 of this year, or heavy damages will be assessed against the contractors.

* * *

E. C. Swaggart is superintendent for the Eugene, Ore., firm bearing his name on the $118,000 contract for surfacing 8.4 mi. of the Thomas Creek-Lyons section of the Albany-Lyons, Ore., secondary hghway.

* * *

Harold T. Mast is superintendent and **C. H. Mast** is crusher superintendent for the Harold T. Mast Co. on the $351,000 contract for resurfacing 7.6 mi. of the Paha to Ritzville road in Adams County, Wash.

* * *

Guy Reid is general superintendent for the Vinnell Co., Inc., for construction of the $239,000 contract for 3 mi. of the Phoenix Canyon Highway, about 38 mi. north of Phoenix, Ariz. **Buck Newberry** is general foreman.

* * *

James W. White is job superintendent for the Spencer Webb Co., contractors on a $377,000 reinforced concrete bridge over Hollywood Freeway at Hill St., Los Angeles. **Paul Fredrickson** is assistant superintendent.

* * *

M. N. Gore is carpenter foreman and **B. Lucchi** is concrete foreman for Joe M. Cesa, contractor on a new $250,000 Antioch, Calif., business center.

* * *

C. H. Brannen is project manager and **Carl W. Needham** is general superintendent for the American Pipe and Construction Co., Pittsburg, Calif., manufacturer of concrete cylinder pipe for the Second Hetch Hetchy aqueduct, being built for the City of San Francisco. **C. G. Cline** is general foreman and **Tom Plumb** is master mechanic at the plant.

* * *

Frank P. Carson is superintendent for Sawtelle Construction Co. on a $35,000 contract for a medical-dental building in Baker, Ore.

* * *

Donald Clayton is superintendent for the Hermann Co. on a $400,000 contract for a sewage treatment plant in Santa Barbara, Calif. **Carl Johnson** is superintendent for the Raymond Concrete Pile Co., subcontractors on the job.

* * *

Harry Olson is general superintendent for William Curlett Construction Co., Long Beach, Calif., on a $500,000 contract for that city's health center. **Frank Muhovich** is carpenter foreman.

* * *

M. W. Hongola is superintendent for the Hongola & Elliott Construction Co. on a $142,000 contract for a 3-mg. water storage reservoir for the City of El Segundo, Calif. **R. H. Elsea** is carpenter foreman and **R. W. Hongola** is labor foreman.

* * *

Harold Stjern is superintendent and **Steve Granberg** is assistant superintendent for the Henrik Valle Co., Seattle, Wash., holder of the $6,500,000 contract for a 5-story addition to the Frederick & Nelson Building in Seattle. **O. E. Christensen** is project manager and chief engineer. **W. J. "Jack" Straith** is assistant manager.

* * *

W. O. Graham is superintendent for W. W. Clyde & Co., Springville, Utah, on the $67,000 contract for construction of two concrete bridges on U. S. 50 and 6, in Grand County, Utah.

* * *

Chester Johnson is job superintendent for the Cahill-Mooney Construction Co., Butte, Mont., on the $925,000 contract for construction of the Butte Civic Auditorium. **John P. Banner** is project manager.

* * *

Art Best is superintendent for Louis C. Dunn, contractor on a $985,000 reinforced concrete building for the Board of Education, Oakland, Calif. **Jack Droitcour** is foreman.

* * *

Edgar W. Beery, formerly with Pacific Bridge Co. on construction of the Hyperion sewerage project at El Segundo, Calif., is now office manager for Stanton-Reed Co., contractor on the new psychopathic ward addition to the Los Angeles County Hospital.

* * *

A. G. Rayther is superintendent for Curlett Construction Co., Long Beach, Calif., on a $800,000 contract for construction of a Manhattan Beach, Calif., high school building. **Art Norbean** is carpenter foreman and **Les Gibson** is labor foreman.

* * *

Carl Nelson is general superintendent for Carl M. Halvorson, Inc., Portland, Ore., and Goleta, Calif., on the $4,755,000 contract for construction of the Tecolote Tunnel and access road on the Santa Barbara, Calif., Project. **Jack Stone** and **Ben Nelson** are foremen, and **R. C. Ogelsby** is night superintendent. **Gordon G. Bawden** is project engineer and **Wesley O. Orrestad** is field superintendent. **Robert E. Eyre** is office manager and **Carl R. Post** is paymaster. Tunnel foremen are **Frank Norton, Sammy Thornhill, Danny Daggs,** and **James Smith.** M. Sanchez & Sons, Santa Ynez, holds the subcontract for excavation. Field office of the Bureau of Reclamation is located in Goleta.

* * *

D. H. Dutton is superintendent for J. A. McNeil Co., Los Angeles, for construction of a $400,000 addition to the Foster Memorial Hospital, Ventura, Calif. **Jerry Johnson** is concrete superintendent. **LeRoy Camon** is office manager.

* * *

Robert L. Kenning is superintendent for the Granite Construction Co., Watsonville, Calif., on a $750,000 contract for state highway construction at Carpenteria, Calif. Foremen are **Art Ostrom,** grading, and **Carl Canoles,** carpenter. **P. A. Hamm** is master mechanic.

* * *

K. C. Muirhead is general superintendent and **R. W. Thomas** is bridge superintendent for L. J. Hessler, contractor on the $295,000 construction of state highway near Ft. Collins, Colo.

* * *

S. "Bill" Killion is the superintendent for Republic Construction Corp., Los Angeles, on construction of the $430,000 addition to the Home for Jewish Aged in Los Angeles. **Harry Killion** is carpenter foreman, **George Warren** is detail man, **Howard Clouse** is layout foreman, **Bill Bandy** is labor foreman, and **Howard Adams** is office manager.

* * *

E. W. Hoggan is the superintendent for Manderbach Construction Co. of Glendale, Calif., on the $175,000 construction of a school in Los Angeles. **H. M. Freeman** is superintendent on the job for California Gunite Co.

* * *

Harry Prater is the superintendent for William P. Neil Co., Ltd., of Los Angeles, on the $150,000 construction of a building for the Gates Rubber Co. in Los Angeles. **Delbert Heath** is carpenter foreman and **Art Cook** is the job engineer.

* * *

H. G. Mercer is the superintendent for Lewis & Queene of Fresno, Calif., who hold the subcontract to N. M. Ball & Sons for handling dirt on the Hollywood

Freeway construction in Los Angeles. **Al Cade** is grading foreman and **Spencer Williams** is the job engineer.

* * *

John "Whitey" Power is superintendent for Starrett Bros. and Eken, Inc., San Francisco, on construction of the administration building for the Metropolitan Life Insurance Company's multi-million dollar Parklabrea housing project at Los Angeles.

* * *

Alex Edgren is superintendent and **Jack Thomas** is carpenter foreman for Meyer Bros. of Los Angeles on construction of a $250,000 building at Los Angeles.

* * *

On construction of new offices for Buttress & McClellan at 1900 Beverly Blvd., Los Angeles, **W. Steinbrenner** is superintendent and **Joe Ruiz** is carpenter foreman.

* * *

A. O. Strandberg is project manager for Morrison-Knudsen Co., Inc., and Peter Kiewit Sons' Co., joint-venture firm for construction of the Grand Coulee Dam pumping plant in Washington. **R. H. Madsen** is assistant project manager, and **Art Moren** is master mechanic.

* * *

V. W. Shell, supervisor of Roy L. Bair & Co., Spokane, Wash., is directing the $244,810 construction of a state highway near Electric City, Wash.

NEW BOOKS . . .

MECHANICAL PROPERTIES OF WOOD—By Frederick F. Wangaard. Published by John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. 380 pages, 6 x 9. Price $6.00.

This volume is a completely reworked version of its predecessor, Dean George A. Garratt's book of the same title published in 1931. Extensive development in timber mechanics and timber engineering and increased knowledge of the effects of various factors on the properties of wood are reflected in the book. It supplies a complete source of information on the technical properties of wood. Comprehensive tables presenting fundamental strength and related properties for 150 American woods are included as well as tables of recommended basic-stress and working-stress values for structural species. Examples illustrating the derivation and application of stress values are given throughout the book.

* * *

ENGINEERS' DICTIONARY, Spanish-English and English-Spanish, Second Edition—By Louis A. Robb. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 640 pages, 6 x 9. Price $12.50.

This is an enlarged edition of a dictionary first published in 1942. Terms pertaining to all branches of civil engineering are brought up to date. Special attention has been given to expanding the terminology on photogrammetry, soil mechanics and airport construction. Electrical and mechanical engineering are covered more thoroughly than in the original edition. Total number of pages in the book has been increased from 450 to 640.

* * *

THE FORT LOUDOUN PROJECT (Technical Report No. 11) — Published by Tennessee Valley Authority, Knoxville, Tenn. 533 pages, 6 x 9. Copies may be procured from the Tennessee Valley Authority, Treasurer's Office, Knoxville, Tenn. Price $2.00.

The Tennessee Valley Authority announces the publication of Technical Report No. 11 on the planning, design, construction, and initial operation of the Fort Loudoun project on the Tennessee River. Besides the importance of the Fort Loudoun project in the over-all system operations, its layout, design, and construction involved problems and methods of particular interest to engineers engaged in similar river control work.

The report covers in detail preliminary investigations for the project, including geology and river flow; dam and powerhouse design; construction methods, including construction plant, river diversion and access facilities; relocation and adjustments; initial operations; and a complete summary of the project costs. The appendixes include a complete statistical summary of physical features of the project; reports of the

engineering and geologic consultants; summaries of special studies; and lists of major purchases of material and equipment. Bibliographies on each phase of the project are also included.

* * *

AUTHOR'S GUIDE—Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. Price $2.00.

A new book designed to aid the technical and scientific writer, this volume is a start-to-finish manual on the most efficient methods of handling manuscript, illustrations and proof. It shows the technical author how his manuscript progresses through principal stages on its way to publication, acquainting him with the functions of several hundred skilled and experienced workers required to bring his work to the printed page. Additional information is included on formal publication and copyright, preparing for reprinting, revisions and new editions, and on details of editorial style.

* * *

HYDROELECTRIC HANDBOOK, Second Edition — By William P. Creager and Joel D. Justin. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 1151 pages, 6 x 9. Price $12.50.

After almost 25 years, this reference work on hydroelectric engineering has been brought to date by the authors and several contributors. During the years since the publishing of the frst edition in 1927, the design and construction of hydroelectric power plants has advanced in both theory and practice. The revised edition brings to date essential information covering these new advances in sufficient quantity to provide data for making preliminary designs, cost estimates and reports.

* * *

THE FIRST TRANSCONTINENTAL RAILROAD — By John Debo Galloway, C.E. Published by Simmons-Boardman Publishing Co., 30 Church St., New York, N. Y. 319 pages, 6 x 9. Price $5.00.

The author of this book was one of the best known civil engineers of the West. The career of J. D. Galloway covered all phases of civil engineering from hydroelectric projects to structural design. His hobby was the history of the West and civil engineering and construction as it developed in this region. His book developed from this interest in the construction of the Central Pacific R. R. The preface was written by Walter L. Huber, consulting engineer of San Francisco, and a long-time friend of the author.

* * *

THE RIGID-FRAME BRIDGE, Third Edition—By Arthur G. Hayden and Maurice Barron. Published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 240 pages, 6 x 9. Price $5.00.

This third edition of a well recognized text has for its principal revision the addition of a simplified method of analysis for skewed arch and frame bridges. Mr. Barron presents an analysis for this type of structure reduced to a minimum form, as compared to the complicated procedures previously available.

* * *

CONCRETE MANUAL, Fifth Edition—Prepared by the Branch of Design and Construction of the Bureau of Reclamation at Denver, Colo. Copies available at $1.75 each from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C., or from the Bureau of Reclamation, Denver Federal Center, Denver, Colo. 489 pages, pocket size.

This fifth edition of the Bureau of Reclamation's Concrete Manual incorporates a number of changes and enlargements over the fourth edition published in 1942. These include: Instructions on the use of air entrainment in concrete, a subject newly added; data on the occurrence and use of pozzolans and their effects on concrete, also new subject matter; new information on the occurrence of alkali-aggregate reaction in concrete and means of preventing concrete deterioration, all expanded; and new procedures for concrete repair, for sampling sealing compounds and mastic joint fillers, and for determining the air content of concrete. A total of 167 illustrations accompany the text material.

New construction at Parklabrea—giant Los Angeles apartment project of the Metropolitan Life Insurance Company—will add eighteen 13-story apartment units, seven 2-story block-long concrete garages and several 2-story apartment structures. Completion of the new $40,000,000 section will provide 2,937 additional apartments, increasing the total number to 4,257 apartments capable of housing about 13,000 persons. Architects are Leonard Schultze and Associates, New York, represented in Los Angeles by Gordon B. Kaufman and J. E. Stanton. Starrett Bros. and Eken, Inc., New York, are general contractors.

"Amazing Results With Plywood Forms..."

on world's largest architectural concrete job!

ONCE AGAIN, forms of Douglas fir plywood provide the smooth, fin-free, easily-finished surfaces which make plywood a preferred material for such work. Close to three million square feet of these modern panels—Exterior fir plywood and plastic-faced plywood—are being used on the huge Parklabrea apartment development in Los Angeles.

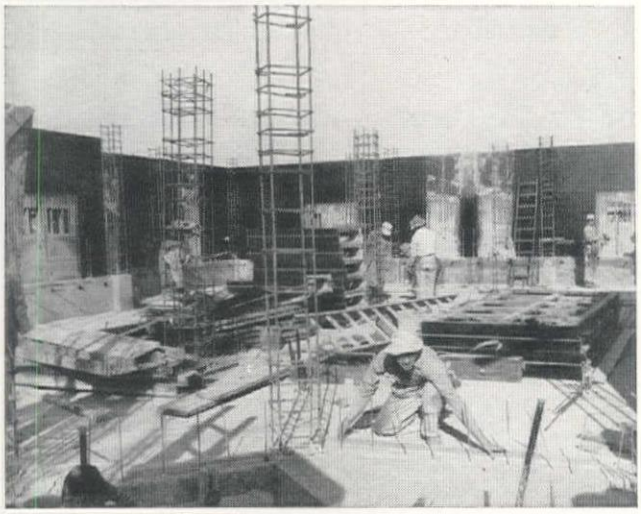
Architects Leonard Schultze and Associates "consider the results amazing."

Parklabrea is another example—a *big* example—of plywood's ability to do a better form job, faster and with less labor. "The plywood produces smooth surfaces, ready for painting. Large size and light weight speed the work, and multiple form re-use reduces costs. There are far fewer joints to rub and grind."

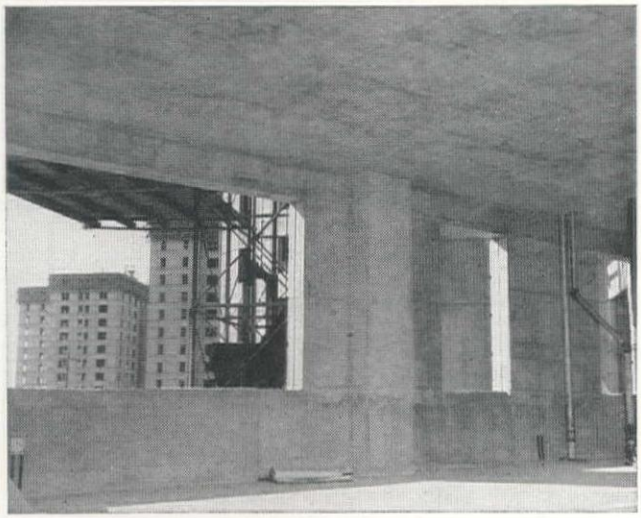
Douglas Fir Plywood

AMERICA'S

Re-Use Another Feature; Only One Set of Plywood Forms Needed for Each Building!



Form reconstruction during pouring operations on each 13-story structure was eliminated; one set of plywood forms gave enough re-uses to complete the job! As pouring progressed, plywood forms were moved up in sections. Nearly a million square feet of plastic-faced plywood formed exterior walls and interior ceilings. Two million square feet of Exterior-type plywood was used for interior walls, foundations, stairwells.



Plastic-faced plywood formed the smooth, blemish-free surface for this ceiling—with only a paint surface needed to finish the job. Ceiling is the underside of a 7-inch thick reinforced concrete slab floor, poured against ⅝-inch panels, nailed to 2″x4″ joists, 24″ on center, with 4″x4″ wales, 4′ on center.

Large, Light, Strong *Real Wood* Panels

For additional data on Douglas fir plywood for concrete form work, see Sweet's File, Architectural, or write (USA only) Douglas Fir Plywood Association, Tacoma 2, Washington. Of particular interest are two booklets: "Concrete Forms of Douglas Fir Plywood" and "Handling PlyForm."

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Concrete Form Panels

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CONCRETE FORM PANEL
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New Keely PlyForm calculator gives construction data for plywood forms, based on hourly rate of pour. Complete with leaflet, "Design Assumptions for New Keely Calculator." Send coupon now!

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Contracts . . .

Summary of Bids and Contracts For Major Projects in the West

Arizona

Daley Construction Co. and **Acme Materials Co.**, Phoenix, were awarded a $212,362 contract by the Arizona Highway Commission for construction of 5.8 mi. of the Holbrook-Lupton highway.

Ashton Building Co., Tucson, has started work on construction of a steel girder and concrete bridge over the Santa Cruz River near the west city limits of Tucson under a $117,300 contract.

Phoenix-Tempe Stone Co., Phoenix, has started work under a $193,165 contract on the grading and draining of 9.7 mi. of highway near Kingman.

Packard Contracting Co., Phoenix, has started work under a $205,731 contract on the grading, draining, select material and bituminous roadmix surfacing of 14 mi. of highway near St. Johns.

California

Winston Bros. Corp., Azusa, Calif., with a bid of $3,022,478, was low before the Corps of Engineers, Los Angeles District, for construction of the spillway and east embankment of the $36,000,000 Whittier Narrows Dam on the San Gabriel River.

Webb & White, Los Angeles, was awarded a $775,147 contract by the Corps of Engineers, Los Angeles District, for construction of channel improvements on the Sawtelle-Westwood System from Braddock Drive to Washington Place.

M & K Corp., San Francisco, was awarded a $372,981 contract by the City and County of San Francisco for construction of Section C of the Lake Street sewer system.

Guy F. Atkinson Co., Long Beach, Calif., was awarded a $2,340,600 contract by the Corps of Engineers, Los Angeles District, for construction on the San Diego River-Mission Bay Floodway in Southern California.

Parish Bros., Benicia, Calif., with a bid of $815,810, was awarded the contract for grading and plantmix surfacing about 4.5 mi. for a 4-lane divided highway near Pittsburg, Calif.

Healy Tibbitts Construction Co., San Francisco, was awarded a $439,300 contract by the East Bay Municipal Utility District at Oakland for installation of intercepting sewer and appurtenances.

United Concrete Pipe Corp., Baldwin Park, Calif., was low before the Bureau of Reclamation with a bid of $1,572,639 for construction of earthwork, pipelines and structures for laterals and sublaterals on the Friant-Kern Canal distribution system south of Fresno.

Guy F. Atkinson Co., South San Francisco, with a bid of $1,879,722 was low before the Santa Clara Water Conservation District for construction of the earth and rockfill Leroy Anderson Dam on the Coyote River near Madrone, Calif.

Gould & Cross, Gardena, Calif., has started work under a $341,512 contract from the Corps of Engineers, Los Angeles District, on channel improvements on Live Oak Wash near La Verne, a part of the San Gabriel River Basin improvement program.

P. & J. Artukovich, Inc., Los Angeles, was awarded a $651,271 contract by the Corps of Engineers, Los Angeles District, for improvement of Compton Creek Channel from Hooper Ave. to Lanzit Ave.

Macco Corp., Paramount, Calif., was low bidder at $432,990 before the Bureau of Reclamation for construction of steel towers to carry the Central Valley Project's West Side 230-kv. Shasta-Tracy transmission lines across the Sacramento and San Joaquin Rivers.

Valley Paving & Construction Co., Inc., Pismo Beach, Calif., was awarded a $153,595 contract for surfacing 5.3 mi. on State Sign Route 152 in Merced County.

Munn & Perkins, Modesto, Calif., was awarded a $197,800 contract for surfacing 11.2 mi. on State Route 109 in Stanislaus County.

M. A. Jenkins, Sacramento, with a bid of $214,526, was low before the Corps of Engineers, Sacramento District, for clearing and channel improvements on the lower Butte Creek near Butte City, Calif.

Hensler Construction Corp., Glendale, Calif., was low bidder at $388,296 for construction of about 21.8 mi. of grading and surfacing near Niland and the Riverside County line.

Griffith Co., Los Angeles, was awarded a $308,228 contract for widening and paving portions of state highway in Orange County.

Leo F. Piazza, San Jose, Calif., was awarded a $100,406 contract for surfacing portions of U. S. 101 in Santa Clara County.

Peter Kiewit Sons' Co., Arcadia, Calif., was low bidder at $207,-943 for plantmix surfacing and sealcoating 11.8 mi. of state highway between Miramar and Lake Hodges in San Diego County.

Mercer Fraser Co. and **Mercer Fraser Gas Co., Inc.**, Eureka, Calif., were awarded a $199,803 contract for surfacing 5.2 mi. on U. S. 101 in Humboldt County.

Harms Bros. and **C. M. Syar**, Sacramento, were awarded a $247,-230 contract for surfacing 6.7 mi. on U. S. 101 between the Klamath River Bridge and Wilson Creek in Del Norte County.

Colorado

Grafe-Callahan Construction Co., Los Angeles, and **Rhoades-Shofner Construction Co.**, Los Angeles, were awarded a $609,800 contract by the Bureau of Reclamation for emergency construction of an irrigation tunnel in Mesa County (see news story page 103 of this issue).

Smith Construction Co., Nashville, Tenn., was low bidder at $415,235 for clearing right-of-way and constructing a transmission line from Kremmling to Oak Creek, Colo., for the Bureau of Reclamation.

Northwestern Engineering Co., Denver, was low bidder at $296,-995 for construction of 13 mi. of state highway between Rangely and Meeker.

Gardner Construction Co., Glenwood Springs, Colo., was low bidder at $302,352 for construction of 2.3 mi. on the northern approach to the Denver Valley Highway.

Ideal Cement Co., Denver, was awarded a $457,288 contract for furnishing 120,000 bbl. of Portland cement for construction of tunnel linings on the Colorado-Big Thompson Project of the Bureau of Reclamation.

Kansas

Freeto Constrution Co., Inc., Pittsburgh, Kansas, was low bidder at $274,329 for construction of 14.4 mi. of pavement patching, widening and asphalt surfacing in Butler County.

M. W. Watson, Topeka, Kansas, was low bidder at $288,156 for construction of 6.2 mi. of concrete pavement in Ford County.

Peter Kiewit Sons' Co., Wichita, Kansas, was low bidder at $319,641 for construction of 6.1 mi. of concrete pavement in Russell County.

Koss Construction Co., Pauline, Kansas, was low bidder at $500,-221 for construction of 9.3 mi. of concrete pavement in Barton County.

Idaho

Barnhart & Wheeler, Pocatello, Idaho, was awarded two contracts for highway jobs by the Idaho State Highway Department. The firm was awarded a $92,917 contract for roadbed, drainage and bituminous surface construction of 1.8 mi. of the Sawtooth Park Highway in Jerome County, and a $77,273 contract for roadbed, drainage and bituminous surface construction on 5.3 mi. of the Barrymore road in Jerome County.

Montana

Conyes Construction Corp., San Pablo, Calif., has started construction on the $8,000,000 pipeline from the oil field at Worland, Mont., to Baker, Mont., for Montana-Dakota Utilities Co. The line will be 12¾-in. pipe.

Nevada

Frank T. Hickey, Inc., Los Angeles, was awarded a $155,152 contract for paving 4,700 ft. of runway at the McCarran Field, Las Vegas.

J. M. Sumsion & Sons, Springville, Utah, was awarded a $308,-223 contract for construction of a highway east from Panaca to the Utah state line in Lincoln County.

Wells Cargo, Inc., Reno, was awarded a $167,321 contract for construction of highway in Lander County.

Dodge Construction Co., Fallon, was awarded a $219,997 contract for construction of a highway in Clark County from Nelson to the Lake Mead recreational area.

Isbell Construction Co., Reno, was awarded a $312,569 contract for widening the Reno-Carson highway to four lanes between Hash and Huffaker lanes.

Silver State Construction Co., Fallon, Nev., was awarded a $261,-800 contract by the Nevada State Highway Department for con-

struction of a portion of the state highway system in Lyon and Churchill Counties.

New Mexico

A. L. Murphy and **Nathan A. Moore,** Los Angeles, were awarded a $457,760 contract by the Bureau of Reclamation for construction of the 700-ft. long concrete Fort Sumner Diversion Dam on the Fort Sumner Project.

Floyd Haake, Santa Fe, has started work under a $235,270 contract on construction of 2.6 mi. of highway in the City of Las Vegas on U. S. 85.

Armstrong & Armstrong, Roswell, has started construction under a $151,261 contract on 9.5 mi. of the Carlsbad-El Paso Gap highway in Eddy County.

G. I. Martin, Albuquerque, has started construction under a $299,276 contract to improve 12.8 mi. of U. S. 54 between Santa Rosa and Vaughn.

Oregon

Guy F. Atkinson Co., Portland, with a bid of $2,846,611, was low before the Corps of Engineers, Portland District, for relocation of 4.5 mi. of the Southern Pacific railroad and 4.5 mi. of Oregon State Highway No. 58 in connection with construction of Lookout Point Dam.

J. S. Anderson Co. and **Morrison & Fisher,** Spokane, Wash., were awarded a $243,302 contract by the Corps of Engineers for 2.3 mi. of channel and levee work along the Walla Walla River near Milton, Ore.

R. A. Heintz Construction Co., Portland, was awarded a $329,489 contract by the Oregon State Highway Commission for ½ mi. of main highway grading and paving and construction of two reinforced concrete grade separation structures on the South Unit of the Denver Avenue-Columbia Slough Section of the Pacific Highway East in Multnomah County.

Porter W. Yett, Portland, was awarded a $113,010 contract for construction of 9.3 mi. of the Halsey-Crawfordsville section of the Halsey-Sweet Home secondary highway.

M. L. and C. R. O'Neil, Creswell, Ore., was awarded a $460,296 contract by the Oregon State Highway Commission for 13.6 mi. of grading and roadbed topping on the Ladd Canyon-North Powder Section of the Old Oregon Trail Highway in Union County.

Utah Construction Co., Richmond, Calif., was low bidder at $672,760 before the Corps of Engineers, Portland District, for relocation of a section of the Southern Pacific Co. railroad in connection with construction of Lookout Point Dam.

Lindstrom Brothers and **John A. Logan** of Portland submitted the low bid of $117,721 to the Bureau of Public Roads for 1½ mi. of grading and bridge construction on the Clackamas River Road near Estacada.

Kuckenberg Construction Co., Portland, was awarded a $272,050 contract by the Corps of Engineers, for construction of a mooring basin, concrete breakwater and appurtenant works at Depoe Bay, Ore.

Utah

Wunderlich Construction Co. and **Curlett Construction Co.,** Long Beach, Calif., and **Charles H. Tompkins,** Washington, D. C., were awarded a $7,897,000 contract by the Corps of Engineers for construction of the Veterans Administration Hospital at Salt Lake City.

W. W. Clyde Construction Co., Springville, Utah, was low bidder at $359,357 before the Utah State Highway Commission for construction of 10.3 mi. of U. S. Highway No. 50 and No. 40 in Tooele County. The firm was also low bidder at $232,186 for construction of 4.1 mi. of road in Summit County near Silver Canyon.

Floyd S. Whiting, Salt Lake City, was low bidder at $448,907 for the bituminous surfacing of 10.4 mi. of state highway in Tooele County.

Washington

Peter Kiewit Sons' Co., Omaha, Neb., was awarded a $1,435,542 contract by the Seattle Board of Public Works for excavation for the Ross Dam powerhouse and tunnels on the City Light Skagit River project.

Guy F. Atkinson Co., Portland, was awarded a $810,310 contract for rebuilding approaches to the toll bridge across the Columbia River at Longview. The project includes replacement of about

one-third mile of timber approach with a steel and concrete structure.

Fiorito Bros., Seattle, with a bid of $354,988, was low before the Port of Seattle for extension of the north-south runway at the Seattle-Tacoma Airport.

Gibbons & Reed Co., Salt Lake City, Utah, was awarded a $1,548,600 contract by the Corps of Engineers, Walla Walla District, for construction of 11.6 mi. of the Spokane, Portland & Seattle railway between Yellepit and Finley, Wash., in connection with McNary Dam on the Columbia River. **Willamette Iron & Steel Co.**, Portland, Ore., was awarded a $330,556 contract for the design, manufacture and delivery of two 350-ton traveling cranes for the McNary powerhouse.

C. V. Wilder Co., Bellingham, and **Gaasland Co.**, Ellensburg, were awarded a contract at $1,015,620 for construction of snowsheds over U. S. Highway 10 in Snoqualmie Pass. The snowsheds will be of concrete, 1,300 ft. and 500 ft. in length.

S. S. Mullen, Seattle, was low bidder at $1,067,800 for construction of the Chief Joseph junior high school building at Richland, Wash.

Funderburk Construction Co., Arlington, Wash., was low bidder at $157,581 for construction of a 6-mi. access road to Blue Mountain in Snohomish County, site of the Navy's $10,000,000 radio communications station at Jim Creek.

General Construction Co., Seattle, submitted the low bid at $1,244,545 for construction of a new highway bridge across the Snake River at Pasco.

J. A. Terteling and Sons, Inc., Boise, Idaho, with a bid of $464,139, was awarded a contract by the Bureau of Reclamation for construction of earthwork, asphaltic membrane lining, pipelines and structures for canal on the Columbia Basin Project.

D & H Paving Co., Vancouver, was low bidder at $239,361 for widening and surfacing 2.7 mi. of State Highway 1 to the Seattle city limits in King County.

Northwest Engineering Co., Seattle, submitted the low bid of $208,093 for paving, grading, sidewalk and sewer construction in the Magnolia District of Seattle.

Sealand Construction Co., Seattle, was low bidder at $235,748 for construction of two bridges in Grays County. The job includes relocation of 1½ mi. of state highway.

Northwest Construction Co., Seattle, was low bidder at $288,327 for surfacing 2.4 mi. and construction of a concrete slab bridge in Mason County.

Curtis Gravel Co., Spokane, was low bidder at $341,695 for surfacing, stockpiling and construction of guardrails on 15 mi. of highway in Grant County.

R. A. Heintz Construction Co., Portland, Ore., was low bidder at $265,842 for grading, draining and surfacing 2.4 mi. of highway in Whitman County.

Wyoming

Brown Construction Co., Pueblo, Colo., was awarded a $276,439 contract for construction of 12 mi. of the Corrington-Cheyenne road in Laramie County. The firm was also awarded a $320,600 contract for construction of 13.8 mi. of the same highway.

Riedesel-Lowe, Cheyenne, has started construction under a $1,073,500 general contract on the new state office building in Cheyenne.

Taggart Construction Co., Cody, was awarded a $298,873 contract for construction of 9.8 mi. of the Basin-Worland Road in Washakie County.

Alaska

Morrison-Knudsen Co., Inc., and **Peter Kiewit Sons' Co.**, were low joint bidders at $3,113,115 for construction of the Murphy Dome military installation near Fairbanks for the Corps of Engineers, Alaska District.

J. H. Pomeroy & Co., Inc., San Francisco, was low bidder at $2,685,795 before the Corps of Engineers, Alaska District, for construction of military installations at Fire Island, Alaska.

C. F. Lytle Co. and **Greene Construction Co.**, Des Moines, Iowa, were low before the Alaska Road Commission at $2,339,810 for construction of Section F of the Richardson Highway in Alaska. The contract is for grading and surfacing the 48-mi. section.

Williams Equipment Co. and **Reed & Martin**, Fairbanks, were low bidders at $389,715 for surfacing a 5.7-mi. section of the Fairbanks-College road.

Lease & Leigland, Seattle, Wash, was low bidder at $421,664 for reconditioning work at Ladd Base and Ft. Richardson in Alaska.

NEWS of DISTRIBUTORS AND FACTORY BRANCHES

KNIGHT

FRANK G. KNIGHT has resigned as executive secretary of Associated Equipment Distributors, and P. D. HERMANN has been named as his successor, according to C. F. HALLADAY of Sioux Falls, S. D., 1950 president of AED. Hermann has been closely identified with many of AED's major activities since joining the executive office staff at Chicago in March 1948, as administrative assistant. During the past year he has served as editor of the Association's official monthly publication, *Construction Equipment News*. A graduate of Northwestern University, he was formerly assistant director of the public relations department at Illinois Institute of Technology. Knight became executive secretary when the AED national headquarters was moved from Washington, D. C. to Chicago in 1947. He was responsible for converting the activities of the Association from wartime governmental reporting to the present program which provides members with services designed to assist them in the operation of their businesses in peacetime. Knight has accepted the position of executive assistant in the Bemiss Equipment Corp., Richmond, Va.

☆ ☆ ☆

Victor Equipment Co., San Francisco, has been named as distributor of Schramm Air Compressors for all of Southern California, taking over the distributorship originally held by *Shaw Sales and Equipment Co.* of Los Angeles. Victor has been distributor for Schramm Air Compressors in Northern California for more than a year. The firm will have complete sale, rental and service facilities for the Schramm line at all its branches—San Francisco, Oakland, Sacramento, Fresno, Los Angeles, Ventura, San Diego, and Chicago, Ill.

☆ ☆ ☆

VIRGIL GRAY, president of *Bay Cities Equipment, Inc.*, of Oakland, Calif., died Feb. 24. He was past president of the Associated Equipment Distributors of Northern California.

☆ ☆ ☆

Dealer franchises for the rental, sale and service of stud welding equipment are being issued to established welding equipment dealers under a new policy announced by LEONARD C. BARR, vice-president and general sales manager of Nelson Stud Welding Division of *Morton Gregory Corp.*, Lorain, Ohio. The announcement coincided with the issuance of franchises to the first 25 dealers, all of whom have stud welding guns available for rental by the day, week or month, as well as for outright purchase.

☆ ☆ ☆

A new *Minneapolis-Moline* Western Division office has been established at 1878 Fortune Road, Bldg. 181, Salt Lake City, Utah. The office will be managed by WILLIAM "BILL" PRATT, who has practical machinery sales experience gained as salesman and sales supervisor for the firm's Midwestern Division at Omaha, Nebr., and holds a civil engineering degree from the University of Minnesota. Operating area of the new division will be the entire state of Utah and sections of Wyoming, Montana, Oregon and Nevada. Present plans call for the appointment of many new dealers to furnish customers of the firm with service, parts and new equipment.

☆ ☆ ☆

ROY E. NELSON, president and general manager of the *Nelson Equipment Co.*, Portland, Ore., died in Pasadena, Calif., on March 13 at the age of 59. Educated at the University of North Carolina, he began his career with the Union Pacific Railway Co. in Washington. He followed civil engineering in Washington until 1911, was a highway and sewer contractor from 1912 to 1916, and then joined the *Howard-Cooper Corp.* in Portland, Ore., as salesman. He became vice-president and general manager and remained with that firm for 20 years. In 1939, he established his own construction machinery, logging and mining equipment distributing firm in Twin Falls, Idaho. In 1941, he moved his company to Portland and did business under the name of Nelson Equipment Co. At present the firm bearing his name does business in both Portland and Seattle, with branches in Spokane and Boise.

ROY E. NELSON, Deceased

☆ ☆ ☆

R. E. JOHNSON has been appointed Los Angeles manager of the *General Electric Company*'s Industrial Division, according to A. D. BRAGG, Pacific District manager. Johnson succeeds E. M. ELLIS, who has become Los Angeles manager of the company's Apparatus Department which includes the Industrial Division. Johnson has been with the company at Los Angeles since 1926.

☆ ☆ ☆

GOVE

EMERY T. GOVE has joined the sales staff of *LaPlant-Choate Sales and Service* at Oakland, Calif., according to JOHN SCHOEN, vice-president and sales manager of the parent company at Cedar Rapids, Ia. Prior to his association with LaPlant-Choate, Gove spent several years as sales manager for *Soule Equipment Co.* of Oakland. During the interval between 1927 and 1945 he was associated with several "Caterpillar" distributors in the central California area.

☆ ☆ ☆

Sioux Road Equipment, Inc., is now distributor for the Series 71 General Motors Diesel engines in South Dakota. The firm now occupies a building 140 x 140 ft. on Sixth St. in Sioux Falls. A complete stock of GM Diesel parts is maintained in its modern parts department, with ample space, equipment and trained personnel to handle any service job including complete overhauls.

☆ ☆ ☆

Southern Equipment & Supply Co. of San Diego, Calif., announces the appointment of CHARLEY "CHUCK" MOONSEN as service manager. He was formerly with *Nelson Equipment Co.* of Portland, Ore.

☆ ☆ ☆

M. B. BARBER, general sales manager of the *Thew Shovel Co.*, Lorain, Ohio, announces the appointment of JOSEPH F. BELES as district manager of the Pacific Northwest territory with headquarters in Portland, Ore. Beles was transferred from Milwaukee where he held the post of district sales manager in the Thew North Midwest territory.

☆ ☆ ☆

New lines taken on recently by the *Ray Corson Machinery Co.* of Denver, Colo., are: *Marion Power Shovel Co., Sicard Manufacturing Co., Davey Compressor*

the FASTEST WAY

to put concrete in the form!

THE MultiFoote gives you a direct pour up to 23 ft. with the standard HighLift Boom (greater heights with longer booms.)

It eliminates intermediate handling equipment and much false work.

It gives you high capacity that comes with a paver.

It brings you crawler mobility that permits working at any point on the job.

It gives you versatility that permits paving highways or floors, pouring footings or wall or feeding concrete pumping equipment or loading trucks.

Don't buy a one-purpose paver! Let us give you complete details on its many advantages.

Built in three sizes—27-E Single Drum, 34-E Single Drum and 34-E Double Drum.

Ask about the Adnun Black Top Paver, the only paver of its kind that will lay black top, stone and cinders.

THE FOOTE COMPANY, INC.
Subsidiary of Blaw-Knox Co.
Nunda, New York

MULTIFOOTE PAVER

FOR EVERY PLACE CONCRETE MUST BE POURED

WESTERN MACHINERY COMPANY
Phoenix, Arizona

LEROI-RIX MACHINERY COMPANY
Los Angeles, California

C. H. GRANT COMPANY
San Francisco, California

COLORADO BUILDERS' SUPPLY CO.
Denver, Colorado

LIVELY EQUIPMENT COMPANY
Albuquerque, New Mexico

CONTRACTORS EQUIPMENT COMPANY
Portland, Oregon

LANG COMPANY, INC.
Salt Lake City, Utah

AIR-MACK EQUIPMENT CO.
Seattle, Washington

WESTERN EQUIPMENT COMPANY
Spokane, Washington; Boise, Idaho Falls, Idaho

NEWS of DISTRIBUTORS AND FACTORY BRANCHES

Co., Campbell Equipment Co., Chem-Therm Co., Champion Manufacturing Co., Insley Manufacturing Corp., and *Mars Co.* The firm is now located in its new building at 350 Klamath St., Denver. RUSSELL DARR and HERMAN KLIPFEL have recently been added to the firm's sales staff.

☆ ☆ ☆

WAYNE F. WATTS has been appointed as a salesman on the staff of the *Capitol Tractor & Equipment Co.*, Sacramento, Calif., according to CARL DANIELSON, president. Watts was formerly with the *J. K. Wheeler Co.* of Salt Lake City. Capitol Tractor & Equipment Co. is northern California distributor for LeTourneau, and Watts will concentrate on this line.

☆ ☆ ☆

Shaw Sales & Service Co. of Los Angeles recently appointed JIM MCCRAE to its sales staff. He was formerly connected with *Link-Belt Speeder Corp.* and *Lima-Hamilton Corp.* He will cover the Los Angeles area for the Shaw firm.

☆ ☆ ☆

Edward F. Hale Co. of Hayward, Calif., has been named northern California distributor for *Highway Equipment Co., Inc.*, Cedar Rapids, Iowa.

☆ ☆ ☆

VERNE E. DODSON has been appointed district manager of engineering for the *General Electric Company*'s Northwestern District with headquarters at Seattle, Wash., according to J. R. MURPHY, district manager of the company's Apparatus Department. Dodson has been assistant to the Pacific District manager with San Francisco headquarters since July, 1948.

☆ ☆ ☆

Appointment of KEITH HOLBROOK as factory sales representative for *Federal Motor Truck Co.* of Detroit, Mich., in the Salt Lake City region has been announced by CARL LOUD, Federal's general sales manager. Holbrook will supervise Federal's factory sales programs and dealer relations in Utah, Arizona, Nevada, northwest Wyoming and southern Idaho.

☆ ☆ ☆

ORLAN SHOOPMAN has rejoined the Western Sales Division of *Caterpillar Tractor Co.* in San Leandro, Calif., as motor grader demonstrator. He was with Caterpillar in the mid-thirties when the firm demonstrated the Diesel No. 12 motor grader, when he demonstrated the machine both in the East and in the West. Most recently, he was with Silver Bros., contracting firm of Hayward, Calif.

☆ ☆ ☆

R. G. HIBBARD has been installed as service manager of the *NorMont Equipment Co.* at Great Falls, Mont. Hibbard spent 10 years as master mechanic for Nolan Bros. and Peter Kiewit Sons' Co. prior to the last war. During the war he was superintendent of the brass plant for the Tooele Ordnance Depot near Salt Lake City. For the past 2½ years, he has been sales engineer for the *Pointer-Willamette Co.* at Billings, Mont. With this background, he is well experienced in supervising shop work and well versed on contractors' equipment problems.

☆ ☆ ☆

Coast Equipment Co., San Francisco, has been appointed distributor in Northern California for the *Joy Manufacturing Co.* of Pittsburgh, Pa. Sales and service will be handled throughout Northern California by Coast Equipment personnel, in addition to sales engineering by the Joy field office in San Francisco. In addition to a wide variety of portable compressors and pneumatic tools, the Joy line includes stationary compressors, air hoists and slushers, rock drilling equipment, core drills, etc.

R. G. LeTOURNEAU, INC., manufacturer of earthmoving equipment, has taken to the road service-wise. The company's giant mobile service training unit (see cut) has started on a nation-wide tour of LeTourneau distributors. The 33-ft. van type trailer carries training material which is set up indoors at distributors' showrooms in a portable classroom which the truck also carries. Used for instruction purposes is a complete selection of equipment cutaways, displays and exhibits.

☆ ☆ ☆

W. B. GREENE, president of *Barber-Greene Co.*, Aurora, Ill., was a visitor to the West last month. His tour included the San Francisco, Portland, Seattle and Vancouver areas.

☆ ☆ ☆

Bay Equipment Co. of Richmond, Calif., has been named Northern California distributor for the *Clyde Iron Works* of Duluth, Minn., and for *Sterling Machinery Co.* of Kansas City, Mo., according to RAY SMITH, president.

☆ ☆ ☆

Macwhyte Co., now at 749 Bryant St., San Francisco, moves to a new location at 141 King St., San Francisco, on April 20, according to FRED SIME, district manager at San Francisco. Phone number remains the same. The modern new quarters has more space for stock, display and storage.

☆ ☆ ☆

Merrill-Brose Co. of San Francisco has added two new men to its sales staff. BOB GREIDER was named salesman for the San Francisco East Bay territory, and will headquarter at the San Francisco office. EDGAR SCHUCK is now salesman for the Sacramento territory, and will headquarter at Sacramento. The firm was recently appointed distributor in Northern California for the *Novo Engine Co.*

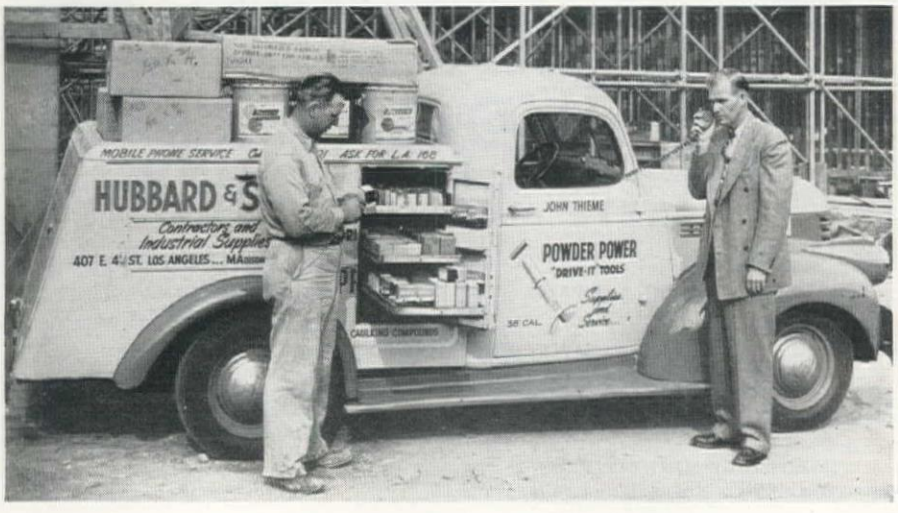
☆ ☆ ☆

Bay Equipment Co. of Richmond, Calif., has added C. E. "GENE" CURRY to its sales staff. For many years he was with *Industrial Equipment Co.* of Oakland and *Coast Equipment Co.* of San Francisco. He will handle inside sales for Bay Equipment.

☆ ☆ ☆

E. M. ELLIS has been appointed Los Angeles manager of the *General Electric Company's* Apparatus Department with headquarters at 212 Vignes St., according to A. D. BRAGG, Pacific District manager. Ellis, who has been manager of the department's Industrial Division at Los Angeles since 1926, succeeds G. F. MAUGHMER, who has been appointed manager of

HUBBARD & STAU, distributor of contractors' and industrial equipment at Los Angeles, is speeding field service by use of a radio-phone equipped service truck. Instead of taking emergency orders over the phone from contractors and foremen who are in a hurry, the switchboard at the firm's main office turns the calls over to a central exchange and the contractor who is calling is put in touch with the radio-phone equipped H & S truck in the field. Thus, the H & S representative can immediately alter his scheduled trip to service the emergency call. Principal reason the firm decided to use the speedy service scheme was to increase the on-the-job availability of the Powder-Power Drive-It Tool.



a newly-created company district with headquarters in St. Louis, Mo.

☆ ☆ ☆

A new sales and service educational program for company distributors and truck and bus operators has been announced by FLOYD L. WHEATON, sales manager of *Bendix-Westinghouse Automotive Air Brake Co.*, Elyria, Ohio, at a series of distributor-management meetings held recently. The complete program consists of two types of training meetings—a service clinic for operators and a sales training program for the sales and service employees of Bendix-Westinghouse distributors.

☆ ☆ ☆

J. D. "BUCK" MCCLUNG has retired from *Marysville Tractor & Equipment Co.*, Marysville, Calif. When the firm was started in 1931, he joined the organization as a salesman, and later took over complete charge of the sales management.

☆ ☆ ☆

Transfer of *American Lumber & Treating Company's* Portland, Ore., sales office from the Terminal Sales Building to 370 Pittock Building has been announced by HENRY GARNJOBST, JR., district sales manager. Promotion and sales in the states of Oregon, Washington, Idaho, and Wyoming of forest products chemically alloyed to resist fire, rot and insects are handled from the company's Portland office.

☆ ☆ ☆

Constructors Equipment Co., Denver, Colo., announces the appointment of O. D. "DEUCE" KINNAMAN as salesman for the Wyoming territory, and B. A. "JOE" BRANNOCK as salesman for the northeastern Colorado territory. Both men have had a wide previous experience in the sale of heavy equipment.

☆ ☆ ☆

Calaveras Cement Co. has appointed GEORGE ELLIOTT as special salesman for the company's recently re-introduced White Portland Cement in the Western States. He will headquarter in San Francisco. ERNEST ROHR will succeed Elliott as company representative in the Fresno, Calif., area. CHARLES H. LAUGHLIN has been appointed sales representative in Modesto, Calif.

☆ ☆ ☆

The name of *Thompson-Sage, Inc.*, Stockton, Calif., has been changed to *Inland Equipment Corp.* Officers of the firm are LEE JONES, president; HARRY SAGE, vice-president; T. M. HAGEL, secretary-treasurer, and EVERTS F. MILLS, second vice-president.

☆ ☆ ☆

On March 9, the *Contractors' Equipment & Supply Co.* of Albuquerque, N. Mex., purchased *Inland Motors, Inc.*, distributor in the State of New Mexico for White Motor Trucks. Present plans call for the consolidation of the two organizations in the location now occupied by Inland Motors at New York and Broadway in Albuquerque. Contractors' Equipment & Supply Co., owned and operated by D. U. RAKESTRAW and FRANK SKIDMORE, is distributor in New Mexico for *R. G. Le-*

Tourneau, Inc., Lima-Shovel & Crane, Michigan Power Shovel Co., Barber-Greene Co., Ingersoll-Rand Co., and numerous other manufacturers of construction equipment. The addition of White Trucks to these lines gives the company a complete line of equipment for highway and building contractors. Rakestraw, president of the combined companies, states that he hopes to effect improved service to customers of both companies by the consolidation.

☆ ☆ ☆

Columbia Equipment Co., Portland, Ore., has contracted with the *Warner & Swasey Co.* of Cleveland, Ohio, to sell the firm's Gradall units in Oregon, Washington and Idaho, according to F. B. McBath, president of Columbia. First shipment of the machines arrived at the firm's Portland headquarters the last week of March.

NEWS of DISTRIBUTORS AND FACTORY BRANCHES

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Brown-Bevis Equipment Co., Los Angeles, Calif., has been given the distributorship in Southern California of the hoisting equipment manufactured by *Superior - Lidgerwood - Mundy Corp.,* Superior, Wis., and the Gradall excavating machines manufactured by *Warner & Swasey Corp.,* Cleveland, Ohio, according to J. A. Beynon, president of Brown-Bevis.

☆ ☆ ☆

The *T. L. Smith Co.* of Milwaukee, Wis., announces the appointment of *Merrill-Brose Co.,* San Francisco, as exclusive distributor for Smith stationary concrete mixers ranging from 28-S to 6-cu. yd. sizes and Smith Mobile Truck Mixers and agitators, all sizes. Merrill-Brose will carry a complete stock of machines and parts.

☆ ☆ ☆

Nevada Equipment Service, Inc., Reno, Nev., has been appointed by the *T. L. Smith Co.,* Milwaukee, Wis., as exclusive distributor for the entire line of Smith Mixers and Smith-Mobile Truck Mixers in northeastern California and Nevada.

☆ ☆ ☆

Contractors Equipment Corp., Portland, Ore., has been appointed Oregon dealer by *Schramm, Inc.,* West Chester, Pa., manufacturer of air compressors and air tools, according to Oliver C. Jessup, president of Contractors Equipment Corp. The Portland firm is stocking a representative line of new equipment and also repair parts for Schramm air compressors. According to Jessup, Rod D. McMillen has been named eastern Oregon sales representative for the firm.

NEWS of MANUFACTURERS

International Harvester Co. has announced the letting of all but one major contract for the construction of a service parts depot, costing about $1,500,000 and to be located in the Trinity Industrial District in Dallas, Texas. The announcement was made jointly by E. H. Watkins and J. H. Matthews, International Harvester motor truck and general sales district managers in Dallas. The Dallas Parts Depot will be the seventh of a chain of twelve depots to be operated by the company throughout the country. It will contain about 200,000 sq. ft. of floor space and will store and ship service parts for all the company's truck, tractor, power and refrigeration products. The depot will serve Harvester dealers and company operations located throughout the states of Texas, New Mexico, and parts of Oklahoma and western Louisiana.

☆ ☆ ☆

Promotion of key sales department personnel by *Kaiser Steel Corporation,* Oakland, Calif., has been announced by C. F. Borden, general sales manager, in a move designed to keep pace with expanding steel sales. J. J. Carlson was promoted from sales manager of the Southern California district to the post of assistant general sales manager, with headquarters in Oakland. Succeeding Carlson in Los Angeles will be C. Lee Emerson, who has served as manager of rolled steel products in Oakland. Reflecting the importance of pipe sales to Kaiser Steel Corp., R. L. Asquith will devote his full time as manager of tubular sales, reporting directly to the gen-

NEWS of MANUFACTURERS

eral sales manager. As a part of this increased emphasis on pipe sales, an office will be established in Tulsa, Okla., with J. H. WEBBER as sales representative. Other changes include the appointment of HARRY BEYMA as manager of rolled products sales, with offices in Oakland. O. D. HOLE will succeed Beyma as manager of cold rolled strip sales with offices in Los Angeles.

☆ ☆ ☆

A. F. FENNER, vice-president of *Mack-International Truck Corp.*, has been named general sales manager, with headquarters in Chicago, Ill. He will direct all of the company's truck, bus and fire apparatus sales and service activities in its Central, Southwestern and Pacific Coast Divisions. In 1927, Fenner was named as manager of Mack's Central Division in Chicago, the position he relinquishes to assume his new duties.

☆ ☆ ☆

Consolidated Western Steel Corporation's steel plate fabrication shop at its Texas plant at Orange went into full production March 1 and the firm's new pipe mill went into production March 15, according to H. C. CRANFILL, vice-president in charge of administration for the U. S. Steel subsidiary plant. The new plate and pipe mills are a major part of the expansion program begun following the purchase of the Orange wartime shipyard from the Government last November.

☆ ☆ ☆

Headquarters of the erection department of *Bethlehem Pacific Coast Steel Corporation's* fabricated steel construction division were moved April 1 from Los Angeles to Alameda, Calif. The new location is the now idle Alameda yard of Bethlehem Pacific's shipbuilding division. The erection department is under the direction of M. H. FRINCKE, manager of erection, and H. M. PITNEY, assistant manager. It was pointed out that the new location would more nearly centralize steel erection headquarters with respect to the locations of the company's fabricating plants as of May 1 when the new Seattle plant is expected to be ready for operation. The company will then have four steel fabricating works—at Seattle, San Francisco, Alameda and Los Angeles.

☆ ☆ ☆

L. R. GUSTIN has been named to the position of assistant superintendent of the Los Angeles Bolt and Nut Plant of *Bethlehem Pacific Coast Steel Corp.* He was formerly general foreman of the department.

☆ ☆ ☆

Caterpillar Tractor Co., San Leandro, Calif., and Peoria, Ill., announces that it has acquired 300 ac. of unimproved land near Joliet, Ill., on which it will immediately start construction of a new factory in which it will manufacture a large portion of the company's extensive line of bulldozers, scrapers, wagons and rippers,

NEWS of MANUFACTURERS

together with the cable and hydraulic controls used in conjunction with such equipment. In March of 1946, Caterpillar announced a multi-million dollar expansion program which has added 2,100,000 sq. ft. of floor space to its Peoria plant. The new plant at Joliet marks an additional expansion of manufacturing facilities with which it is planned to achieve the greatest possible economy in the manufacture and distribution of Caterpillar products. T. R. "TED" FARLEY, vice-president of the company, has been named general manager of the new plant. With Caterpillar for many years in key positions, he has been in charge of special projects since 1946.

☆ ☆ ☆

THOMAS F. SCANNELL, general sales manager of the *Falk Corp.*, Milwaukee, Wis., announced recently the appointment of ARTHUR L. LARSON as assistant to the sales manager. Larson also moves up to the position of manager of the sales inquiries division. WILLIAM J. URBAN, former special representative in coupling sales, has been appointed manager of coupling sales. The new manager of distributor sales is DON K. LAMBERT. He was previously special representative in the distributor sales division. ROLAND E. GOVAN heads sales promotion, a newly-organized department at Falk.

☆ ☆ ☆

Mall Tool Co. of Chicago recently announced the acquirement through its subsidiary firm, *Mall Tool, Ltd.*, Toronto, Canada, of the assets and good will of *Hornet Industries, Ltd.*, Guelph, Ontario, Canada. Hornet for many years produced a Canadian-made chain saw now in wide use throughout Canada and many places in the United States. Manufacture of Hornet chain saws and the service of the Hornet models will be continued by *Mall Tool, Ltd.*

☆ ☆ ☆

RICHARD AUBREY has been appointed assistant to F. M. RICH, *Kaiser Steel Corp.* vice-president in charge of operations, as liaison man on tubular steel products. In this capacity, Aubrey will stimulate sales and help solve customers' pipeline problems as part of Kaiser Steel's expanding entry into production of big pipe for the pipeline and petroleum industries. Aubrey, who holds several patents on tubular testing procedures, has been with *Youngstown Sheet and Tube* for 26 years, the last ten in research.

☆ ☆ ☆

The promotion of A. WILLIAM "BILL" McGRAW to the position of general sales manager of the Warco-Hercules Road Machinery Division of *W. A. Riddell Corp.*, Bucyrus, Ohio, has been announced by JACQUE E. JONES, general manager. McGraw, who has had extensive experience in the sales and servicing of heavy construction machinery, will have complete charge of all sales activities of Warco

UNIT BID SUMMARY

Bridge and Grade Separation . . .

Washington—Cowlitz County—State—Approaches

Guy F. Atkinson Co., Portland, Ore., with a bid of $810,310, was low before the Washington State Highway Department for reconstruction of approaches of the Columbia River Bridge at Longview. The bid includes excavation, precast concrete and timber piling installation and placement of about 4,000,000 lb. of steel. Unit bids were submitted as follows:

(1) Guy F. Atkinson Co. $810,310
(2) Anderson Bridge Construction Co. 836,910
(3) Peter Kiewit Sons' Co. 847,124
(4) General Construction Co. 853,633
(5) S. Mullen, Inc. 870,132
(6) C. S. Montag & Sons $897,419
— J. H. Pomeroy & Co., Inc. 897,975
— M. P. Butler 937,150
— State Construction Co. 958,704

	(1)	(2)	(3)	(4)	(5)	(6)
17,500 cu. yd. common excav. including all haul	.30	1.00	.75	1.00	.85	.60
2,000 cu. yd. struct. excav.	2.00	3.00	4.00	4.00	5.50	3.00
Lump sum, shoring and cribs	$35,000	$20,000	$36,000	$10,000	$33,600	$8,000
6.0 M.b.m. timber and lumber (untr) in place	200.00	200.00	275.00	250.00	284.00	200.00
1,920 cu. yd. concrete, Class A, in place	51.00	60.00	50.00	49.00	62.00	62.50
590 cu. yd. concrete, Class B, in place	18.00	50.00	22.00	35.00	48.00	30.00
100 cu. yd. concrete, Class D, in place	16.50	40.00	22.00	30.00	27.00	30.00
547,000 lb. steel reinforcing bars in place	.082	.09	.09	.09	.105	.095
3,420,000 lb. structural carbon steel in place	.127	.125	.14	.1325	.128	.144
33,200 lin. ft. furn. timber piling (untreated)	.33	.35	.35	.34	.36	.36
6,300 lin. ft. furn. precast concrete piling	2.76	4.00	2.65	3.75	2.85	2.85
6,360 lin. ft. furn. precast concrete pile extension	3.80	5.50	3.60	5.00	3.90	3.90
60 only driv. timber piles (untreated) in place	44.00	50.00	55.00	50.00	55.00	70.00
90 only driv. precast concrete piles in place	89.00	80.00	85.00	70.00	92.00	90.00
492 only driving composite piles in place	78.00	50.00	75.00	45.00	91.00	78.00
1 only furn. and driv. precast conc. test piles	550.00	800.00	550.00	600.00	650.00	550.00
2 only furn. and driv. timber test piles	300.00	400.00	550.00	250.00	600.00	550.00
45,000 lb. cast steel in place	.28	.40	.33	.25	.47	.25
46 only bridge drains complete in place	51.00	60.00	60.00	80.00	60.00	65.00
Lump sum, removing portions of exist. struct.	$53,800	$30,000	$25,000	$75,000	$20,600	$60,000
500 cu. yd. gravel blanket in place	2.30	4.00	4.50	5.00	4.25	2.75
920 cu. yd. rock riprap in place	2.85	6.00	3.65	5.00	4.25	4.00
6 days mechanical tampers	45.00	50.00	35.00	40.00	40.00	40.00

Utah—Grand County—State—Concrete

W. W. Clyde & Co., Springville, with a bid of $66,862, was awarded a contract by the State Road Commission of Utah for construction of two reinforced concrete bridges, 87 and 71 ft. long respectively. Unit bids were submitted as follows:

(1) W. W. Clyde & Co. $66,862
(2) Young & Smith Construction Co. 68,969
(3) Griffith, Gornall & Carman, Inc. 69,173
(4) Springmeyer Investment & Construction Co. 79,025
(5) Waterfall Construction Co. ..... $ 87,436
— Rex F. Moss 104,015
— Better Buildings, Inc. 114,023
(6) Engineer's estimate 79,217

CONCRETE BRIDGE, SAGER'S WASH—86.83 FT.

	(1)	(2)	(3)	(4)	(5)	(6)
787 cu. yd. excavation for structures	2.50	2.00	3.00	4.00	6.00	4.00
508 cu. yd. concrete, Class "A"	50.00	52.00	48.00	55.00	60.00	55.00
73,300 lb. reinforcing steel	.105	.12	.115	.13	.12	.13
162.8 lin. ft. steel handrail	12.00	12.00	11.00	12.50	16.00	15.00
1 ea. removal of existing structure	500.00	900.00	$2,000	$2,000	$3,000	$1,500
6 cu. yd. gravel backfill	5.00	6.00	10.00	10.00	5.00	5.00

CONCRETE BRIDGE, PINTO WASH—71.0 FT.

750 cu. yd. excavation for structures	2.50	2.00	3.00	4.00	6.00	4.00
345 cu. yd. concrete, Class "A"	52.00	50.00	48.00	55.00	60.00	55.00
69,100 lb. reinforcing steel	.105	.12	.115	.13	.12	.13
142 lin. ft. steel handrail	12.00	12.00	11.00	12.50	16.00	15.00
1 ea. removal of existing structure	500.00	500.00	$1,750	$1,500	$2,000	$1,500
8 cu. yd. gravel backfill	5.00	6.00	10.00	10.00	5.00	5.00

California—Glenn County—State—Steel

Transocean Engineering Corp., San Lorenzo, Calif., with a bid of $73,575, was low before the California Division of Highways for construction of a steel bridge and approaches at Big Butte Creek, about 6½ mi. east of Butte City. Unit bids were submitted as follows:

(1) Transocean Engineering Corp. $73,575
(2) M. A. Jenkins 79,447
(3) Fredrickson Bros. 80,351
(4) Lew Jones Construction Co. 81,007
(5) Underground Construction Co. 81,255
(6) H. Earl Parker, Inc. 82,543
— R. G. Clifford 82,679
— C. B. Tuttle 83,068
— Gordon C. Weems & Baker Trucking Co. $84,350
— Elmer I. Warner 85,184
— E. H. Peterson & Co. 85,391
— E. G. Perham 87,175
— Chittenden & Chittenden 89,031
— O'Connor Bros. 96,807
— J. P. Brennan 101,746

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, clearing and grubbing	$1,800	500.00	$1,000	400.00	300.00	250.00
Lump sum, remov. exist. bridge	$5,330	$4,000	$3,700	$5,000	$4,000	$4,800
1,000 cu. yd. roadway excav.	.80	1.00	.60	.55	.60	.40
260 cu. yd. struct. excav.	2.00	4.00	5.50	15.00	5.00	2.00
3,700 cu. yd. imported borrow	1.08	1.00	.85	.80	.80	.68
2,000 cu. yd. gravel base	1.35	2.00	1.40	1.95	2.00	1.34
Lump sum, dev. wat. supply and furn wat. equip.	$1,000	300.00	600.00	150.00	200.00	85.00
170 M. gal. applying water	3.00	3.00	1.50	1.50	2.00	1.00
11 sta. finishing roadway	25.00	20.00	10.00	16.00	20.00	10.00
4 ton. liq. asph., SC-2 (pen. tr.)	40.00	40.00	50.00	63.00	80.00	40.00
10 cu. yd. sand (pen. tr.)	50.00	8.00	10.00	7.00	8.00	8.00
15 ton liq. asph. SC-4 (B.S.T.)	40.00	37.50	35.00	29.00	35.00	30.00
2,050 sq. yd. prep. mix. and shap. surface (B.S.T.)	.25	.40	.12	.25	.30	.10
1 ton asphaltic emuls. (sl. ct.)	45 00	60.00	50.00	90.00	100.00	75.00
Lump sum, detour bridge	$8,884	$4,400	$5,500	$5,500	$5,000	$4,830
410 cu. yd. Class "A" P.C.C.	38.39	47.00	55.00	45.00	50.00	58.40
343 lin. ft. conc. railing	2.60	9.00	5.00	7.50	5.00	5.00
160,000 lb. structural steel	.085	.11	.11	.10	.11	.104

(Continued on next page)

FRUEHAUF CARRYALL LOAD CAPACITY UNKNOWN!

WANT to haul a huge girder, locomotive, power shovel, any heavy machinery or device used in the construction industry? Then do it with the Carryall, the "Tough Guy" that carries a load safely, quickly, economically and puts it anywhere it must go.

There are five Standard Fruehauf Carryall models: C-15, for 10 to 20 tons; C-35, for 20 to 35 tons; C-50, for 36 to 50 tons; C-60 for 45 to 60 tons and the C-75 for 60 to 75 tons. Model C-75 is a Semi-Trailer and usually requires a "jeep". Other models can be used as Semi-Trailers or Full Trailers. Then there is the Carryall "special" shown here . . . with load capacity unknown. It has a proven test of 220,000 pounds, but as yet has never been loaded to capacity.

Fruehauf also builds a full line of Machinery Trailers (completely floored) in capacities up to 40 tons and Tilt-Deck models up to 30 tons.

THIS ONE WAS SEVERELY TESTED!

220,000 pounds (that's 110 tons) on this Carryall . . . and still no sign of strain or overload!

To satisfy himself that his Carryall "special" could really take it, a West Coast user loaded a mountain of metal on this Fruehauf husky. At the 220,000 pound mark he was satisfied that this Fruehauf could carry his loads . . . and more!

FRUEHAUF Trailers

"ENGINEERED TRANSPORTATION"

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY

Western Manufacturing Plant, Los Angeles

Sales and Service: Los Angeles • San Francisco • Portland • Boise
Seattle • San Diego • Fresno • Sacramento • Spokane • Billings
Salt Lake City • Phoenix • Albuquerque • El Paso • Denver

NEWS of MANUFACTURERS

motor graders and Hercules road rollers. His new duties will include intensification of the company's program of manufacturer-distributor cooperation in all phases of marketing, sales and service, and supervision of Riddell's own field sales organization.

☆ ☆ ☆

PHIL NORTON, general sales manager of *Wisconsin Motor Corp.*, has been named as a vice-president of the company, according to HAROLD A. TODD, president. Norton has been connected with the company for twenty years in a sales capacity, occupying the position of general sales manager for the past ten years.

☆ ☆ ☆

Kaiser Steel Corp., Oakland, Calif., has announced the promotions of two veterans of the iron and steel industry—GEORGE B. MCMEANS to be works manager and EDWARD J. DUFFY as general superintendent of the Kaiser Steel plant at Fontana, Calif. McMeans succeeds F. M. RICH, who has resigned to take a position with an Eastern steel company, and Duffy succeeds McMeans as general superintendent.

☆ ☆ ☆

A lease has been signed between the Alaska Railroad and the *Permanente Cement Co.*, Oakland, Calif., on a section of waterfront property in Anchorage, Alaska, for the purpose of erecting a cement distribution plant to serve the rail belt area of Alaska, according to W. A. MARSH, general manager. The facilities, which will include bulk storage silos, sacking machinery and dockage, will be designed to permit the most efficient handling of overseas shipments of bulk cement. By providing cement storage facilities at Anchorage and at other points as demand warrants, Permanente will be able to give an immediate service to the Alaska construction industry that has heretofore been unavailable.

☆ ☆ ☆

F. S. JONES has been elected vice-president in charge of sales for the *Colorado Fuel and Iron Corp.*, Denver. Since 1913, Jones has held managerial positions in most of the company's territory, occupying offices in Grand Junction, Salt Lake City, Oklahoma City and Denver. JAMES N. COUNTER, advancing from Rocky Mountain Division sales manager, becomes general manager of commercial steel sales, the position vacated by Jones. Counter has filled several district managerships with the firm in the past. Both men will be located at the firm's general offices in Denver.

☆ ☆ ☆

Hyster Co. of Portland, Ore., and Peoria and Danville, Ill., has taken over the manufacture and sale of Turret Trucks formerly produced by the *Salsbury Corp.* of Los Angeles, according to ERNEST G. SWIGERT, president of Hyster. Now manufactured at Hyster's Danville, Ill., plant, the new line of horizontal materials handling trucks

Lump sum, cleaning and painting steel bridges	$2,000	$1,600	$1,600	$1,600	$1,500	$1,600
1,740 lin. ft. furn. conc. piling	3.00	3.50	4.00	3.20	3.00	3.25
52 ea. driving conc. piles	65.00	90.00	80.00	133.00	150.00	185.00
55,500 lb. bar reinf. steel	.068394	.085	.08	.08	.10	.081
14 ea. portable timber barricades	30.00	20.00	50.00	50.00	25.00	77.00
Lump sum, misc. items of work	400.00	500.00	50.00	250.00	100.00	150.00
90 lin. ft. metal plate guard railing	5.50	3.00	3.50	4.00	4.00	3.50

Dam . . .

Montana—Flathead County—U.S.B.R.—Clearing Reservoir Area

Wixson & Crowe, Inc., and J. H. Trisdale, Inc., both of Redding, Calif., were awarded $2,446,850 and $2,484,360 contracts respectively for clearing the remaining 14,695 acres of land in the Hungry Horse Reservoir area. The work is situated from 25 to 45 mi. southeast of Columbia Falls. The work was divided into five schedules. The award to Wixson and Crowe was for work on Schedules 1 and 3; that to Trisdale, Schedules 2, 4 and 5. Unit bids were submitted as follows:

(1) Wixson & Crowe, Inc. (Schedules 1 and 3 only) $2,446,850
(2) J. H. Trisdale, Inc. (Schedules 2, 4 and 5 only) 2,484,360
(3) Nello L. Teer Co. (All Schedules) 5,925,625
(4) E. L. Gates & Co., Inc. (All Schedules) 5,936,550
(5) Schutt-Oman and Assoc. (All Schedules) $6,113,120
(6) Bay Construction, Inc. (All Schedules) 7,722,875
(7) Engineer's estimate (All Schedules) 6,231,850

Sched.		(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Clearing—3,335 ac.	369.00	.....	445.00	415.00	416.00	525.00	400.00
2	Clearing—2,950 ac.	.....	419.00	520.00	520.00	416.00	650.00	525.00
3	Clearing—3,505 ac.	347.00	.....	390.00	425.00	416.00	500.00	460.00
4	Clearing—1,895 ac.	.....	322.00	400.00	370.00	416.00	500.00	440.00
5	Clearing—3,010 ac.	.....	212.00	260.00	275.00	416.00	450.00	300.00

Waterway Improvement . . .

Oregon—Lincoln County—Corps of Engineers—Dredging and Breakwater

Kuckenberg Construction Co., Portland, with a bid of $272,050, was low before the Portland District, Corps of Engineers, for excavation of a mooring basin and entrance channel to a depth of 8 ft. at mean lower low water and construction of a concrete breakwater, retaining wall and a check dam at Depoe Bay, Ore. A total of 200 calendar days are allowed for completion of the project. Unit bids were submitted as follows:

(1) Kuckenberg Construction Co. $272,050
(2) A. L. Murphy & Nathan A. Moore 303,700
(3) Lloyd Calkins 311,079
(4) Tauf Charneski 314,773
(5) Manson Construction & Engineering Corp. & Osberg Construction Co. 344,132
— C. J. Eldon 353,371
— G. D. Dennis & Sons 367,783
— General Construction Co. $369,751
— F. W. Case & Harry Gast 380,629
— Miller & Strong, Inc. 399,360
— Guy F. Atkinson Co. 451,518
— Macco Corp. 454,778
— Lee Hoffman 523,087
(6) Engineer's Estimate 330,797

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, cofferdams	$27,500	$40,000	$30,000	$10,000	$30,000	$35,200
Lump sum, unwatering (initial and during life of job)	$15,000	$10,000	$25,000	$5,000	$45,000	$12,850
90,000 cu. yd. excav. and disp. of matl, from basin (incl. fdtn. excav. for retaining wall)	.80	1.10	1.00	1.25	1.00	.98
1,500 cu. yd. excav. and disp. of rock from entrance channel	2.00	10.00	10.00	5.00	6.40	6.50
Lump sum, prep. of base for breakwater, alternate loca.	$1,000	$1,000	$2,000	$2,000	$1,750	$1,300
2,000 cu. yd. struct. excav. for check dam, incl. backfilling and disp. of material	2.00	1.00	2.00	2.00	4.20	3.20
140 cu. yd. crushed rock or gravel in filter blanket, in place	4.00	4.00	3.00	4.00	4.00	3.70
260 cu. yd. dumped stone revetment, in place	4.00	7.00	3.00	5.00	5.00	3.40
5,300 cu. yd. conc. for retain. wall and check dam, in pl.	17.00	16.00	15.00	21.00	17.00	20.50
450 cu. yd. conc. for breakwater in pl., alternate loca.	20.00	22.00	40.00	21.00	27.00	42.00
8,630 bbl. Portland cement, Type II	5.00	4.30	4.30	5.10	5.75	4.90
1,100 lb. steel dowels, in place	1.00	.20	.20	2.00	.80	.50
550 lb. metal water stops, in place	2.00	1.30	1.00	3.00	1.40	1.50
Lump sum, instal. of misc. steel fastening consisting of hinge anchors, eye bolts and pipe sockets	250.00	150.00	$2,000	100.00	500.00	193.00
Lump sum, drainage system, complete (including clay tile and cast iron pipe, lamp hole and cover, sand and gravel (or cr. rock.) filter, and 2 automatic drainage gates, in place)	$1,500	976.00	$3,000	$2,500	$2,500	$3,800
Lump sum, excav. of intercepting drain	750.00	200.00	$1,500	100.00	500.00	260.00
Lump sum, catchment basin unwatering system	$1,000	250.00	$2,000	600.00	500.00	230.00

California—San Diego County—Corps of Engineers—Floodway Improv.

Guy F. Atkinson Co., Long Beach, Calif., was apparent low bidder before the Los Angeles District, Corps of Engineers, at $2,340,600, for the San Diego River and Mission Bay Improvement Floodway from the Pacific Ocean to Highway U. S. No. 101. Site of the work is at Mission Bay and the adjacent San Diego River Channel in the City of San Diego. Principal features of the work include levee construction; stone levee bank protection; dredging; miscellaneous earthwork; stone jetty construction, etc. A total of 720 calendar days will be allowed for completion. Unit bids were submitted as follows:

(1) Guy F. Atkinson Co. $2,340,600
(2) Peter Kiewit Sons' Co. 2,522,910
(3) Macco Corp. 2,553,112
(4) Grafe-Callahan Construction Co. and Gunther & Shirley Co. 2,660,737
(5) Clyde W. Wood & Sons, Inc. 2,697,763
(6) United Concrete Pipe Corp., Westbrook & Pope, and Vinnell Co. 2,850,922
— Bressi & Bevanda Constructors, Inc. 2,885,074
— Cox Bros. Construction Co. and J. E. Haddock, Ltd. 3,224,983
(7) Engineer's estimate (without profit) 2,324,849

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1,000,000 cu. yd. harbor dredging: to required depth, 900,000 cu. yd.; overdepth, 100,000 cu. yd.	.26	.32	.33	.44	.323	.46	.20
2,208,000 cu. yd. floodway channel excavation	.26	.37	.33	.44	.323	.43	.29
492,000 cu. yd. levee fill	.10	.10	.22	.10	.27	.13	.25

(Continued on next page)

NEWS of MANUFACTURERS

will be known as Hyster Salsbury Turret Trucks and will be sold and serviced by all the company's distributors.

☆ ☆ ☆

Two executive changes have been announced by A. A. GARTHWAITE, president of *Lee Rubber & Tire Corp.*, Youngstown, Ohio. O. S. DOLLISON, formerly vice-president and general manager of the Republic Rubber Division, has been elected vice-president of the Lee Rubber and Tire Corp. with headquarters at Youngstown. E. M. IKIRT, formerly assistant treasurer of the Republic Rubber Division, has been appointed general manager of the division.

☆ ☆ ☆

The appointment of ROY D. HAWORTH, JR., as manager of product development of the Carbide Alloys Division of *Alleghany Ludlum Steel Corp.*, Pittsburgh, Pa., has been announced by R. T. EAKIN, division manager. Haworth was formerly employed by *Armour Research Foundation* in Chicago as supervisor of abrasion research. He has contributed many articles and papers on the subject.

☆ ☆ ☆

HAROLD CLARK has been named general sales manager of the *Rosco Manufacturing Co.*, Minneapolis, Minn., according to T. W. ROSHOLT, president. For the past two years, Clark represented the company as sales manager in the territory east of the Mississippi River.

☆ ☆ ☆

Promotion of DON ANDERSON to sales manager of the Pump Department has been announced by the *Jaeger Machine Co.*, Columbus, Ohio. He has been with the department for 15 years and was in charge of pump testing before entering its sales division in 1940. A. C. SAXE, manager of the Pump Department, will continue to direct all engineering service and development work on dewatering and pressure pumps of the self-priming centrifugal type.

☆ ☆ ☆

The Board of Directors of *Coleman Motors Corp.*, Littleton, Colo., announces that HARLEIGH R. HOLMES, SR., has been promoted from President to Chairman of the Board of Directors. HOWARD H. AGEE was elected President, E. L. MARTIN, Vice-president, and WILLIAM C. RAMSEY, Secretary-treasurer.

☆ ☆ ☆

F. R. BURNETTE has been appointed Assistant Vice-president of Engineering for the *United States Steel Corp. of Delaware*, it was announced recently by M. W. REED, Vice-president. In this newly created position, Burnette, a graduate civil engineer, will have special duties in connection with the future construction programs of United States Steel. In 1912 he joined Aluminum Co. of France and Aluminum Co. of America at Baden, N. C., returning to U. S. Steel in 1916 as engineer of Coke Works for American Steel and Wire Co.

26,000 cu. yd. backfill, stabilizer and toe	.10	.05	.18	.05	.15	.24	.15
84,000 cu. yd. filter material	1.94	2.00	2.30	1.50	1.93	2.32	1.30
57,500 ton quarrystone, Class "A"	2.84	2.50	2.30	2.70	3.00	2.54	2.80
44,500 ton quarrystone, Class "B"	2.84	2.50	2.30	2.45	3.00	2.54	2.60
15,000 ton quarrystone, Class "C"	2.84	2.50	2.30	2.40	3.00	2.54	2.80
108,500 ton quarrystone, Class "D"	2.84	2.58	2.70	2.40	3.00	2.54	2.80
200,000 ton quarrystone, Class "E"	2.84	2.60	2.60	2.10	3.00	2.54	2.80
8,500 ton quarrystone, Class "F"	2.84	2.50	4.30	2.40	3.00	2.54	2.85
290 cu. yd. concrete	81.00	72.00	120.00	150.00	75.00	82.00	42.00
31,000 lb. reinforcing steel	.10	.10	.12	.10	.10	.13	.09
480 lin. ft. 20-in. steel pipe	20.00	15.50	17.00	6.00	17.00	23.00	12.50
160 lin. ft. 5-in. steel pipe	4.00	3.00	2.00	1.30	3.50	6.00	3.00
504 lin. ft. 60-in. reinf. concrete pipe	25.00	25.00	23.00	24.00	30.00	35.00	20.50
84 lin. ft. 36-in. reinf. concrete pipe	15.00	10.00	15.00	12.00	12.25	13.00	10.50
8 ea. 60-in. drainage gate	955.00	925.00	$1,000	$1,000	250.00	$1,300	975.00
1 ea. 36-in. drainage gate	270.00	280.00	400.00	400.00	400.00	600.00	340.00
15,000 (100 square sq. ft.) addtl. sheepsfoot rolling	.04	.05	.10	.03	.04	.30	.06

Highway and Street . . .

Washington—Douglas County—State—Grade and Surf.

C. E. Oneal, Ellensburg, Wash., with a bid of $465,075, was low before the Washington State Department of Highways for the grading and surfacing with light bituminous surface on 13.7 mi. of Primary State Highway No. 10, between Bridgeport and Leahy. Unit bids were submitted as follows:

(1) C. E. Oneal	$465,075	(6) Erickson Paving Co.	$506,529
(2) Goodfellow Bros.	480,109	— N. Fiorito Co.	510,764
(3) Roy L. Bair & Co.	486,322	— P. L. Saddler	519,034
(4) Sather & Sons	491,993	— F. R. Hewett Co.	526,295
(5) Peter Kiewit Sons' Co.	497,778	— McNutt Brothers	597,748

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, clearing and grubbing	$2,000	$11,000	$3,500	$3,000	$1,000	$1,000
514,780 cu. yd. unclass. excav. haul of 600 ft.	.22	.20	.20	.26	.22	.23
4,425 cu. yd. com. trench excav. incl. haul of 600 ft.	.40	.30	1.00	.60	.60	1.25
1,500 cu. yd. strip. borrow and surf. pits incl. haul	.15	.25	.25	.25	.15	.25
326,100 cu. yd. sta. overhaul	.01	.01	.01	.01	.015	.01
1678.13 M. cu. yd. sta. overhaul	4.00	2.00	3.50	4.00	5.00	5.00
1,595 cu. yd. structure excavation	1.50	2.00	2.00	2.00	1.50	2.00
113 day mechanical tamper	10.00	30.00	40.00	30.00	26.50	30.00
64,200 lin. ft. slope treatment Class B	.10	.10	.05	.10	.10	.14
726.0 sta. (100 ft.) finishing roadway	8.00	10.00	5.00	10.00	10.00	15.00
2,060 M. gal. water in place	2.00	2.00	3.00	2.00	3.50	2.00
6,240 cu. yd. sand filler in place, including haul	.50	.75	.70	.25	.75	.75
80 cu. yd. gravel backfill for drains in place	2.00	5.00	5.00	4.00	5.00	5.00
25,485 ton crushed stone surf. top course in place	.95	.96	1.00	.90	1.20	.96
7,030 ton crushed cover stone in stockpile	.90	.90	.95	.80	1.05	.90
121,930 ton ballast in place	.80	.80	.80	.84	.85	.80
LIGHT BITUMINOUS SURFACE TREATMENT						
13.7 mi. preparation, construction, finishing	200.00	200.00	150.00	165.00	125.00	200.00
440 ton asphalt cement MC-2 in place	39.50	39.50	42.00	40.50	38.00	40.00
3,780 cu. yd. crushed cover stone in place from stkpl.	1.35	1.35	1.00	1.25	1.60	1.25
5,750 ton crse. cr. screenings ⅝-in. to ¼-in. in stkpl.	1.10	1.05	1.10	1.10	1.55	1.05
1,620 ton fine cr. screenings ¼-in. to 0-in. in stkpl.	1.00	1.05	1.10	1.10	1.55	1.05
MISCELLANEOUS ITEMS						
8 only reflector units in place	10.00	10.00	15.00	10.00	10.00	10.00
211 cu. yd. concrete Class A in place	60.00	55.00	60.00	50.00	45.00	65.00
14 cu. yd. concrete Class C in place	60.00	45.00	60.00	70.00	70.00	75.00
34,350 lb. steel reinforcing bars in place	.10	.10	.13	.11	.11	.115
12 cu. yd. rubble masonry riprap in place	30.00	25.00	50.00	25.00	30.00	30.00
30 lin. ft. conc. or V.C. dr. pipe 4-in. diam. in place	1.00	1.00	1.00	1.00	.70	.90
350 lin. ft. conc. or V.C. dr. pipe 12-in. diam. in place	1.25	1.60	1.25	1.50	1.45	1.50
282 lin. ft. pl. conc. culv. pipe 12-in. diam. in place	1.45	2.00	1.40	2.00	1.65	1.75
2,655 lin. ft. std. reinf. conc. culv. pipe 18-in. dia. in pl.	2.95	4.00	3.00	3.25	3.55	3.50
654 lin. ft. std. reinf. conc. culv. pipe 24-in. dia. in pl.	4.25	5.00	4.50	4.60	6.00	4.65
198 lin. ft. std. reinf. conc. culv. pipe 36-in. dia. in pl.	8.50	11.25	9.00	9.00	11.00	10.00
120 lin. ft. std. reinf. conc. culv. pipe 48-in. dia. in pl.	12.50	15.00	14.00	12.00	16.00	17.00
120 lin. ft. bit. c'td corr. mtl. culv. pipe, type 2 #16 ga. 8-in. diam. in place	2.65	2.00	2.50	2.00	2.25	2.75
315 lin. ft. bit. c'td corr. mtl. culv. pipe, type 2 #8 ga. 84-in. diam. in place	39.00	45.00	40.00	40.00	60.00	44.00
5,260 lin. ft. std. beam guard rail in place	2.25	2.40	2.50	2.50	2.75	2.55
296 only reinf. conc. right-of-way markers in place	4.00	5.00	5.00	5.00	6.00	5.00
1,000 cu. yd. loose riprap Class A in place	1.00	2.00	2 50	1.50	3.50	2.75
6 cu. yd. hand placed riprap in place	10.00	10.00	10.00	10.00	15.00	15.00
BRIDGES						
535 cu. yd. structure excavation	3.00	3.00	3.00	4.00	4.00	6.00
Lump sum, shoring and cribs	500.00	$4,500	$11,000	$2,000	$2,000	$9,000
730 cu. yd. concrete Class A in place	65.00	60.00	70.00	58.00	55.00	57.00
73 cu. yd. concrete Class B in place	60.00	45.00	60.00	58.00	50.00	57.00
829 lin. ft. reinf. conc. bridge railing in place	8.00	9.50	8.00	8.00	6.00	9.00
199,00 lb. steel reinforcing bars in place	.10	.10	.12	.11	.10	.115
6 only bridge drains complete in place	60.00	60.00	100.00	60.00	50.00	65.00
1,800 lin. ft. furn. precast concrete piling	5.00	6.00	4.50	4.00	5.00	4.60
50 only driving precast conc. piles in place	50.00	150.00	80.00	70.00	55.00	90.00
2 only furn. and driv. precast conc. test piles	$1,200	875.00	$1,500	500.00	750.00	$1,400

Nevada—Mineral County—State—Grade and Surf.

Nevada Constructors, Inc., Reno, Nevada, with a bid of $129,881, was low before the Nevada Department of Highways for the grading and roadmix surfacing of 13.76 mi. of highway from near Hawthorne to the U. S. Naval Ammunition Depot Boundary. Unit bids were submitted as follows:

(1) Nevada Constructors, Inc.	$129,881	(5) Phoenix Construction Co.	$168,494
(2) Westbrook & Pope	135,256	(6) Isbell Construction Co.	170,013
(3) Wells Cargo, Inc.	146,921	(7) Dodge Construction, Inc.	176,050
(4) Silver State Construction Co.	166,678		

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum, signs	300.00	300.00	500.00	500.00	500.00	500.00	500.00
119,090 cu. yd. roadway excav.	.20	.23	.31	.38	.35	.35	.39
1,810 cu. yd. drainage excav.	.30	1.15	2.00	.50	.50	.60	.75
606 sta. V-type ditches	4.00	2.30	7.00	5.00	5.00	5.00	7.50
10,845 cu. yd. borrow	.20	.23	.25	.25	.35	.30	.39
157,140 yd. sta. overhaul	.01	.01	.02	.015	.01	.02	.02
1,130 yd. mi. overhaul	.20	.30	.13	.20	.20	.20	.20

(Continued on next page)

NEWS of MANUFACTURERS

He became assistant chief engineer in 1937 and transferred to Carnegie-Illinois in 1939, where he was successively construction superintendent and assistant chief engineer.

☆ ☆ ☆

JAMES E. LOSE, Vice-president in Charge of Operations, *Carnegie-Illinois Steel Corp.*, Pittsburgh, Pa., has been elected Executive Vice-president of this largest steel-producing subsidiary of United States Steel Corp., it has been announced by President BENJAMIN F. FAIRLESS.

☆ ☆ ☆

J. V. DOLL has joined *Mack-International Motor Truck Corp.*, New York, as Vice-president, Fleet Sales, and as special assistant to H. W. DODGE, Executive Vice-president. For the past 20 years, Doll has been associated with the *Texas Co.* as manager of the National Sales Division.

☆ ☆ ☆

EDWARD A. MALMBERG has recently been appointed Sales Engineer for the Export Division of *Euclid Road Machinery Co.*, Cleveland, Ohio. He has been assigned to the Far Eastern territory, including Indonesia, Malaya, India, Pakistan, Siam, China, and Japan.

930 cu. yd. struct. excav.	1.11	1.15	2.00	1.50	1.50	1.50	2.50
1,750 cu. yd. backfill	.50	2.30	1.25	1.00	1.50	1.50	1.50
44,090 ton selected material surface	.53	.53	.45	.70	.80	.80	.65
116 ton liquid asphalt, Type MC-2 (Seal)	30.00	30.00	30.00	30.00	30.00	32.00	33.00
1,390 ton liquid asphalt, Type SC-2 or SC-3 (roadmix)	25.40	25.00	26.00	29.50	26.00	28.00	30.00
13.76 mi. roadmix	500.00	700.00	500.00	700.00	600.00	650.00	700.00
570 sq. mi. roadmix intersections	.15	.20	.20	.25	.50	.25	.30
2,474 lin. ft. 24-in. corrugated metal pipe	4.50	3.70	3.90	4.00	4.50	4.10	4.00
446 lin. ft. 30-in. corrugated metal pipe	5.50	4.70	5.00	5.00	5.50	5.10	5.00
1,122 lin. ft. 36-in. corrugated metal pipe	8.30	7.25	7.25	7.00	8.00	7.50	7.50
152 cu. yd. grouted hand-laid riprap	25.00	17.25	25.00	15.00	30.00	25.00	30.00
159 ea. culvert markers and guide posts	5.00	5.35	6.00	5.00	10.00	6.00	7.50
62 ea. right-of-way markers	5.00	6.30	6.00	6.00	10.00	8.00	6.00

California—Tulare County—State—Grade and Surf.

George E. France, Inc., Visalia, Calif., with a bid of $123,805, was low before the California Division of Highways for grading and surfacing with roadmixed surfacing on cement-treated imported base material on Lover's Lane, between State Route 134 and 6 mi. north, the total length of the project being approximately 6 mi. Unit bids were submitted as follows:

(1) George E. France, Inc.	$123,805	— Louis Biasotti & Son	$153,361
(2) P. J. Moore & Son	132,104	— Valley Paving & Construction Co.	159,316
(3) Anderson Co.	137,932	— Valpa Bros.	159,395
(4) Oilfield Trucking Co. & Phoenix Construction Co.	138,251	— Griffith Co.	163,328
		— George Pollock Co.	173,766
(5) K & H Co.	141,534	— Covina Construction Co.	178,181
(6) Rice Bros., Inc.	143,869	— Halloran & Gill	179,909
(7) Rand Construction Co.	144,115	— Clyde W. Wood & Sons, Inc.	182,442
— Nevada Construction Co.	146,534	— Elmer J. Warner	185,985
— Munn & Perkins	147,141	— Madonna Construction Co.	199,852
— Gene Richards, Inc.	148,000	— Dicco, Inc. & DixSyl Construction Co.	200,116
— Frank T. Hickey, Inc.	151,993		

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
15,000 cu. yd. roadway excavation	.26	.30	.32	.25	.40	.44	.35
105 cu. yd. structure excavation	2.75	2.00	2.50	2.00	2.50	2.75	3.00
35,000 sq. yd. compact. orig. ground	.035	.06	.03	.05	.05	.05	.04
15,500 cu. yd. imported base material	.72	.77	.69	.86	.65	.92	.85
55,500 cu. yd. imported subbase material	.44	.48	.55	.61	.55	.55	.65
50,900 sq. yd. scarifying existing surface	.015	.02	.02	.02	.03	.01	.015
Lump sum, dev. wat. sup. and furn. wat. equip.	$1,652	$6,000	$3,500	$1,000	$5,000	$7,855	$6,000
7,300 M. gal. applying water	.90	1.25	1.00	1.10	1.25	1.00	.75
318 sta. finishing roadway	5.00	6.00	7.00	5.00	10.00	4.90	8.00
107,000 sq. yd. mix. and compact. (cem. tr.)	.0525	.07	.11	.07	.095	.062	.10
2,050 bbl. Portland cement (cem. tr.)	3.67	3.93	4.00	4.00	3.50	4.00	3.50
110 ton liquid asphalt SC-2 (pr. ct.)	17.35	16.90	20.50	18.00	20.00	19.75	17.50
109,000 sq. yd. mix. and compact. (rd.-mix. surf.)	.07	.06	.055	.07	.08	.05	.06
17,100 ton min. aggr. (road-mix. surf.)	1.85	1.63	1.75	1.78	1.50	1.85	1.68
860 ton liq. asph. SC-5, SC-6, or pav. asph. 200-300 penetration (rd.-mix. surf.)	17.85	16.90	18.50	18.00	20.00	19.70	18.00
46 ton asphaltic emulsion (sl. ct.)	35.00	26.00	33.50	30.00	30.00	29.00	35.00
160 lin. ft. 30-in. R.C.P. culvert (std. str.)	6.00	7.00	6.00	7.00	10.00	5.35	6.00

Oregon—Klamath County—State—Grade and Surf.

Peter Kiewit Sons' Co., Longview, Wash., with a bid of $853,882, was low bidder before the Oregon State Highway Department for the grading and bituminous macadam surfacing of 6.74 mi. of The Dalles-California highway. Unit bids were submitted as follows:

(1) Peter Kiewit Sons' Co.	$853,882	(6) Guy F. Atkinson Co.	$ 988,134
(2) Roy L. Hough & Son	919,644	— Leonard & Slate Oregon, Ltd.	1,109,267
(3) Rogers Construction Co.	952,364	— McNutt Bros.	1,121,120
(4) Natt McDougall Co.	961,294	— J. N. & M. J. Conley	1,184,974
(5) Kuckenberg Construction Co.	961,695		

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, clearing and grubbing	$2,000	$10,000	$20,000	$12,600	$5,000	$11,000
220 cu. yd. struct. excav., unclassified	4.00	2.50	4.00	1.80	10.00	2.65
32,000 cu. yd. canal excav., unclassified	.25	.25	.30	.28	.25	.35
875,000 cu. yd. general excav., unclassified	.41	.56	.57	.58	.58	.68
4,800,000 yd. sta. short overhaul	.01	.01	.01	.005	.01	.004
550,000 cu. yd. sta. long overhaul	.51	.35	.38	.38	.35	.30
6.74 mi. finishing roadbed and slopes	750.00	500.00	600.00	$1,000	500.00	510.00
560 lin. ft. 18-in. corrugated metal pipe	3.65	3.25	4.00	3.65	4.00	4.00
120 lin. ft. 24-in. corrugated metal pipe	5.30	4.85	5.00	5.50	5.00	6.00
280 lin. ft. 36-in. corrugated metal pipe	10.60	9.70	10.00	11.80	11.00	11.00
140 lin. ft. 48-in. corrugated metal pipe	14.60	12.80	16.00	16.50	15.00	16.00
2 only 48-in. metal headgate	600.00	500.00	400.00	480.00	500.00	620.00
130 only concrete sight posts	11.00	12.00	10.00	10.55	10.00	10.00
3,200 cu. yd. dry rubble masonry	12.00	10.00	10.00	17.70	15.00	15.00
13,000 cu. yd. 1½-in. - 0-in. rock in leveling course	1.50	2.25	2.30	2.20	2.50	2.51
2,200 cu. yd. ¾-in. - 0-in. scr. reject matls. in shdlrs.	1.40	2.25	1.25	2.05	3.00	2.51
800 M. gal. sprinkling	1.50	2.50	2.00	2.00	2.00	2.50
6.74 mi. preparation of base	200.00	300.00	200.00	225.00	250.00	300.00
7,900 cu. yd. furn. and placing aggregates	2.75	4.00	3.50	3.50	4.00	3.20
620 tons furn. and placing 121-150 asphalt	35.00	34.50	36.00	38.05	45.00	31.00
1,400 lin. ft. furn. treated timber piling	1 35	1.45	1.45	1.55	1.50	1.40
320 lin. ft. furn. 10-in. x 10-in. x 42-lb. steel piling	2.60	3.50	3.50	3.70	5.00	4.65
320 lin. ft. furn. 12-in. x 12-in. x 53-lb. steel piling	3.25	4.35	4.35	4.60	6.00	6.40
32 only drive treated timber piles	95.00	80.00	80.00	90.00	50.00	77.00
20 only drive steel piles	95.00	85.00	85.00	95 00	50.00	77.00
330 cu. yd. Class "A" conc.	54.00	55.00	55.00	60.00	60.00	61.00
69,000 lb. metal reinforcement	.10	.11	.11	.115	.10	.11

Nevada—Lincoln County—State—Grade and Surf.

J. M. Sumsion & Sons, Springville, Utah, with a bid of $308,223, was low before the Nevada Department of Highways for the grading and roadmix surfacing with liquid asphalt of 10.54 mi. of state highway from 10 mi. east of Panaca to the Nevada-Utah state line. Unit bids were submitted as follows:

(1) J. M. Sumsion & Sons	$308,223	(6) Dodge Construction Co.	$349,743
(2) W. W. Clyde & Co.	324,276	— Phoenix Construction Co.	382,019
(3) Silver State Construction Co	325,832	— Hoops Construction Co.	419,032
(4) Strong Co.	326,233	— Reynolds Construction Co.	419,093
(5) Isbell Construction Co.	339,104		

	(1)	(2)	(3)	(4)	(5)	(6)
Lump sum, signs	500.00	$1,000	500.00	$1,000	500 00	500.00
67 ac. clearing	50.00	185.00	100.00	100.00	200.00	95.00
100 lin. ft. remove culvert pipe	1.00	2.00	1.00	1.50	2.00	1.50
90,073 cu. yd. roadway excavation A	.23	.35	.30	.28	.30	.36

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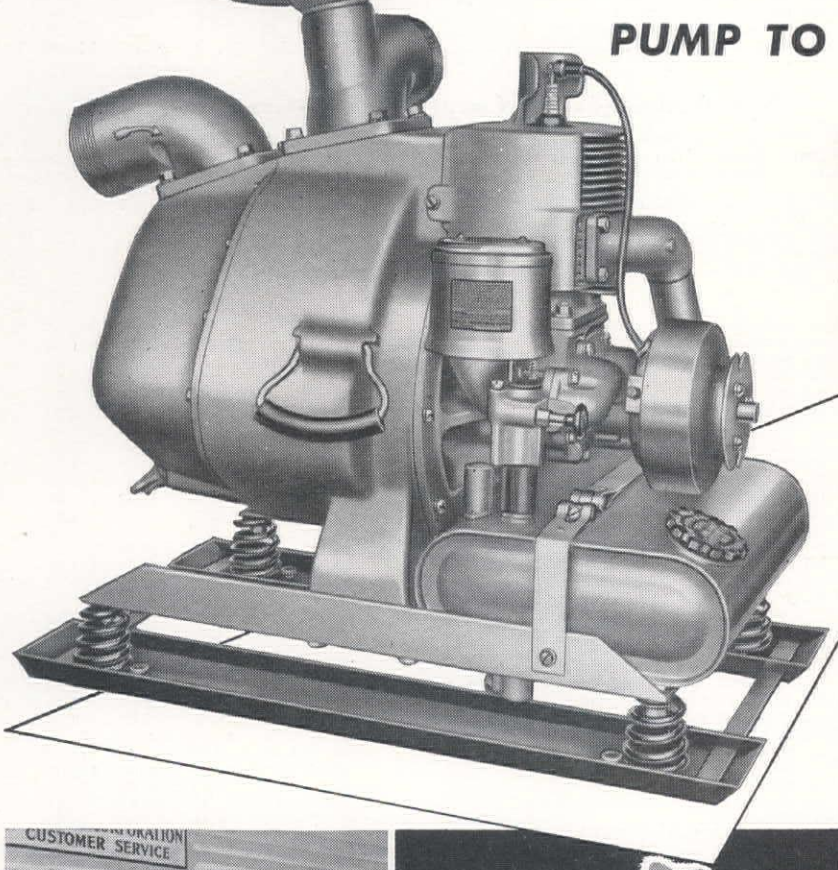
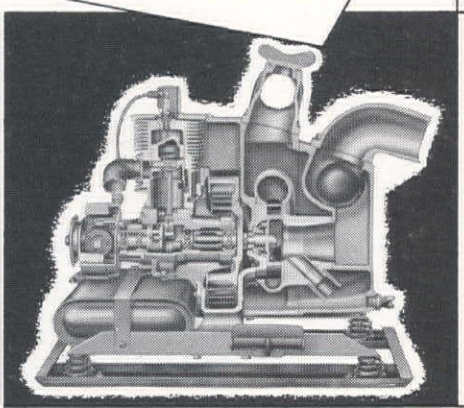
FOR 3 BIG REASONS

A HOMELITE CARRYABLE PUMP IS THE PUMP TO HAVE ON THE JOB



1. PERFORMANCE. Just add it all up . . . lightweight for easy handling, 15,000 gallons per hour, the fastest self-priming possible, a guaranteed 28 ft. suction lift, automatic seepage control, no trouble with clogging *even when handling mud and solids* . . . that's what you always get from a Homelite *carryable* gasoline-engine-driven pump that can be set up for operation easily and quickly *anywhere*.



2. DEPENDABILITY . . . continuous trouble-free performance . . . is the result of all the special features that Homelite engineers build into their pumps . . . replaceable abrasive-resistant wear plates, a simple five-part sealing device and impeller that require no grease, packing or attention and a non-clogging pump body directly attached with no bearings necessary, to the famous Homelite Gasoline Engine, the result of building over 275,000 gasoline-engine-driven units this past quarter century.

3. SERVICE. To keep Homelite pumps operating continuously, just as the day they were first delivered, a chain of exclusive Homelite service shops extend across the nation. These service stations are completely stocked and staffed by trained Homelite men who are ready to keep your Homelite pumps in top notch condition at all times.

STICK TO THE RULE OF THREE 1. Performance 2. Dependability 3. Service, and you'll always stick to a Homelite.

DEPENDABILITY
PERFORMANCE
SERVICE

Homelite Corporation

1304 RIVERDALE AVENUE, PORT CHESTER, NEW YORK

122,737	cu. yd. roadway excavation B	.84	.74	.90	.69	.70	.96
620	cu. yd drainage excavation	.50	.75	.50	1.25	1.00	1.00
282	sta. V-type ditches	5.00	6.00	5.00	7.00	6.00	6.00
26,410	cu. yd. borrow	.23	.25	.20	.24	.28	.30
621,700	yd. sta. overhaul	.015	.015	.02	.015	.02	.02
42,050	yd. mi. overhaul	.15	.15	.20	.15	.20	.20
880	cu. yd. structure excavation	2.00	2.00	2.00	2.00	2.00	2.00
1,730	cu. yd. backfill	1.00	2.00	1.00	1.50	1.50	1.50
10,460	M. gal. water	2.00	2.00	1.00	2.50	2.50	1.50
Lump sum,	furnish water equipment	$10,000	$5,000	$10,000	$9,000	$9,000	$10,500
260	hr. power roller	6.00	6.00	4.00	6.50	6.50	5.00
13,340	ft. hr. tamping roller	.50	.625	.25	.60	.50	.50
12,970	ton Type 1 gravel base	.70	.80	.48	.81	.70	.60
46,160	ton gravel surface	.85	.90	1.10	.97	1.20	1.00
86	ton liquid asphalt, Type MC-2 (seal)	28.00	32.00	28.00	33.60	35.00	30.00
1,100	ton liquid asphalt, Type SC-3 (roadmix)	26.00	28.00	25.00	31.20	25.50	27.50
10.54	mi. roadmix	500.00	600.00	700.00	700.00	650.00	750.00
136	cu. yd. Class A concrete	75.00	70.00	70.00	60.00	70.00	52.50
10,520	lb. reinforcing steel	.15	.14	.14	.12	.13	.15
2,562	lin. ft. 24-in. corrugated metal pipe	3.50	3.85	4.00	4.50	4.00	4.00
190	lin. ft. 30-in. corrugated metal pipe	5.00	4.75	5.00	5.50	5.00	5.00
320	lin. ft. 36-in. corrugated metal pipe	7.35	7.25	7.00	8.50	7.25	7.50
100	lin. ft. 48-in. corrugated metal pipe	11.00	12.00	9.00	12.00	9.50	10.85
57	cu. yd. hand-laid riprap	8.00	15.00	20.00	25.00	20.00	15.00
152	ea. culvert markers and guide posts	6.00	6.00	5.00	7.00	6.00	6.00
108	ea. right-of-way markers	5.00	6.00	6.00	7.00	7.00	7.50
2,420	sq. yd. paved ditches	.10	.50	.50	1.25	.25	.30
Lump sum,	special cattle guard	$2,500	$2,200	$1,500	$2,500	$2,500	$1,500

New Mexico—Colfax County—State—Grade and Surf.

W. T. Bookout Construction Co., Las Vegas, N. M., with a bid of $496,228, was low before the New Mexico State Highway Department for the grading and surfacing with plantmix bituminous surfacing of 6.98 mi. of the Raton-Springer highway. Unit bids were submitted as follows:

(1)	W. T. Bookout Construction Co.	$496,228	
(2)	G. I. Martin	511,870	
(3)	Brown Construction Co.	513,631	
(4)	Armstrong & Armstrong	516,336	
(5)	Allison & Haney	543,729	
—	Peter Kiewit Sons' Co.	$545,131	
—	Henry Thygesen & Co.	552,719	
—	San Ore Construction Co.	553,287	
—	Sharp and Fellows Contracting Co.	555,258	
(6)	Engineer's estimate	571,172	

		(1)	(2)	(3)	(4)	(5)	(6)
Lump sum,	removal of old structures	$4,000	$5,000	$3,000	$4,000	$4,750	$1,050
Lump sum,	removal of obstructions	$1,040	$1,000	$1,000	$1,200	600.00	$1,000
308,590	cu. yd. excavation, unclassified	.18	.24	.24	.25	.22	.30
1,842	cu. yd. excavation for structures	4.50	3.00	2.00	2.00	3.00	2.00
4,891	cu. yd. excavation for pipe culverts	3.55	1.00	2.00	1.50	3.50	2.00
414,350	sta. yd. overhaul	.03	.02	.02	.02	.02	.02
968,100	¼ mi. yd. haul	.04	.04	.05	.035	.06	.05
143,711	ton mi. haul	.07	.15	.07	.06	.07	.08
866	hr. mechanical tamping	4.00	5.00	4.00	4.00	4.00	5.00
3,097	hr. rolling, sheepsfoot roller	3.50	4.00	2.00	4.00	5.00	5.00
602	hr. rolling, steel tired roller	4.50	5.00	6.50	5.50	5.00	5.00
2,556	hr. rolling, pneumatic tired roller	3.50	3.00	2.00	3.50	4.00	5.00
70,850	ton ballast	.54	.50	.62	.58	.56	.50
44,550	ton leveling course	.45	.60	.75	.70	.74	.60
11,527	M. gal. watering	.50	1.50	.50	1.00	1.50	2.50
841.5	cu. yd. Class "AE-AR" concrete	62.00	50.00	43.00	60.00	49.00	50.00
1030.5	cu. yd. Class "AE-AR" concrete for curb and gutter and sidewalk	36.00	36.00	40.00	40.00	32.00	30.00
575	sq. yd. waterproofing	1.50	1.50	1.00	.85	.75	1.00
109,517	lb. reinforcing steel	.10	.10	.11	.11	.10	.13
15,100	lb. structural steel	.50	.30	.20	.30	.25	.20
326	lin. ft. stand. reinf. conc. culv. pipe, 18-in. diam.	3.75	3.40	4.35	5.00	4.70	5.00
1,600	lin. ft. stand. reinf. conc. culv. pipe, 24-in. diam.	5.10	4.95	5.50	5.60	5.50	6.50
1,180	lin. ft. stand. reinf. conc. culv. pipe, 30-in. diam.	7.20	6.95	8.50	8.00	8.00	9.00
1,340	lin. ft. stand. reinf. conc. culv. pipe, 36-in. diam.	9.15	9.00	11.00	10.30	10.00	11.75
1,004	lin. ft. stand. reinf. conc. culv. pipe, 42-in. diam.	12.00	11.50	12.00	13.25	14.00	13.50
3	ea. cattle guard, 12-ft. roadway	900.00	$1,200	800.00	900.00	$1,000	$1,000
2	ea. monuments and markers	100.00	50.00	50.00	50.00	50.00	50.00
53,950	lin. ft. galvanized barbed wire fence	.20	.14	.13	.13	.13	.12
151	ea. bracing	4.00	4.00	3.00	5.00	6.00	7.00
13	ea. gates, standard	30.00	40.00	10.00	45.00	10.00	25.00
29	ea. tr. timber warn posts, reflect. (6-in. diam.)	7.00	5.00	7.00	5.00	7.00	7.00
110	ea. right-of-way markers	7.00	6.00	6.00	5.00	7.00	5.00
1.9	mi. obliterating old road	300.00	200.00	200.00	200.00	200.00	200.00
11,400	lin. ft. contour ditches	.12	.05	.10	.06	.10	.15
2,887	bbl. asphalt Type RC-2	5.33	5.50	5.80	6.00	6.30	7.00
10,213	ton hot plant asphaltic surfacing	4.50	5.00	5.50	4.25	4.70	6.00
3,428	bbl. 85-100 asphalt (for hot plant asph. surf.)	5.50	6.30	5.80	6.30	7.00	7.00
6.981	mi. asphalt processed base	750.00	600.00	800.00	$1,000	750.00	500.00
3,739	cu. yd. selected borrow, topsoil	1.00	.50	.40	.35	.74	.50
1,500	ton stockpiled surfacing material	.77	.60	.75	.55	.58	.60

California—Contra Costa County—State—Grade and Surf.

Parish Bros., Benicia, Calif., with a bid of $815,811, was low bidder before the California Division of Highways for the grading and plant-mix surfacing on existing pavement and on cement-treated base, construction of a curbed central dividing strip and two reinforced concrete bridges to provide a four-lane divided highway between Port Chicago Road and Pittsburg, a distance of about 4.5 mi. Unit bids were submitted as follows:

(1)	Parish Bros.	$815,811	
(2)	United Concrete Pipe Corp.	853,223	
(3)	Fredrickson Bros.	871,123	
(4)	Fredrickson & Watson Construction Co.	880,806	
(5)	Dan Caputo and Edward Keeble	912,457	
(6)	Guy F. Atkinson Co.	923,923	
—	H. Earl Parker, Inc. and M. M. Ball Sons	$ 965,564	
—	Lord & Bishop and M.J B. Construction Co.	992,865	
—	Harms Bros.	1,036,426	
—	Charles L. Harney, Inc.	1,244,866	

		(1)	(2)	(3)	(4)	(5)	(6)
520	cu. yd. removing concrete	2.50	2.30	2.50	2.20	1.00	2.00
1,300	sq. yd. removing exist. P.C.C. pavement	.60	1.25	2.00	.50	.50	.50
1,900	lin. ft. removing exist. raised bars	.15	.15	.05	.10	.25	.15
Lump sum,	clearing and grubbing	$1,500	$1,000	$2,200	$5,119	$2,000	$1,000
575,000	cu. yd. roadway excavation	.21	.20	.20	.22	.20	.24
1,670	cu. yd. ditch and channel excav.	.65	.35	.65	.75	.75	.75
12,300	cu. yd. structure excavation	2.00	1.30	2.00	2.00	1.50	2.00
635	cu. yd. structure excavation (bridges)	2.00	1.15	1.75	3.30	4.00	1.75
375	cu. yd. structure backfill (bridges)	3.50	1.70	2.75	2.75	4.00	3.50
110,000	sq. yd. compact. orig. ground	.06	.04	.05	.03	.04	.03
4,500,000	sta. yd. overhaul	.003	.004	.003	.003	.004	.003
146,000	cu. yd. imported base material	.80	1.00	1.15	1.00	1.20	1.30
90,000	sq. yd. preparing slopes (erosion control)	.05	.05	.06	.05	.06	.04

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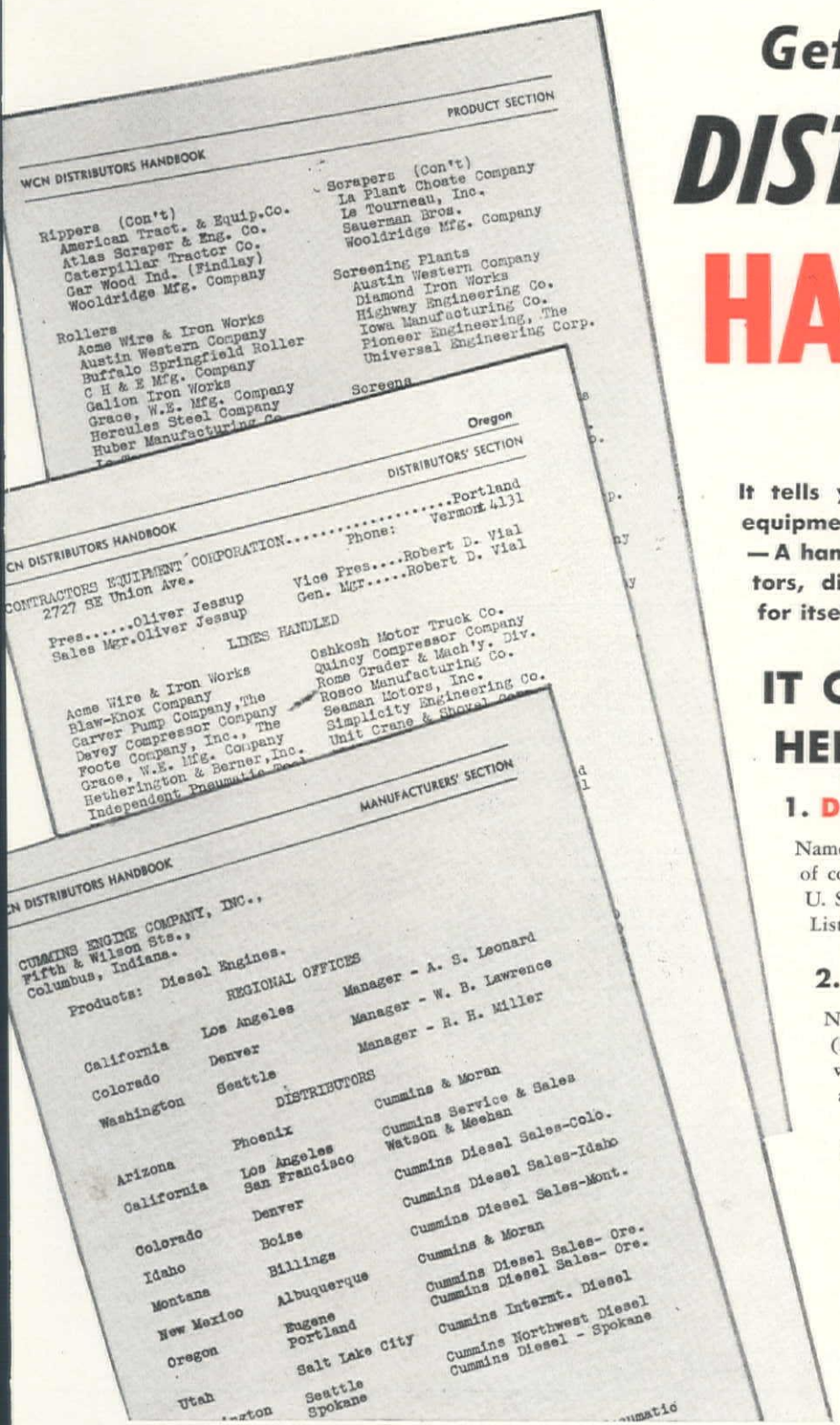

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2. MANUFACTURERS

Names of construction equipment manufacturers (listed alphabetically for entire U. S.), together with products, locations of their Western branches, and names of their Western distributors.

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24	tons fertilizer (erosion control)	85.00	90.00	85.00	86.00	100.00	90.00
6,100	lb. seed (erosion control)	.28	.30	.27	.27	.30	.29
135	ton straw (erosion control)	50.00	50.00	50.00	43.50	60.00	50.00
43,500	sq. yd. cultivating (preparatory landscaping)	.065	.07	.07	.07	.15	.035
Lump sum,	dev. water supply and furn. wat. equip.	$7,000	$6,000	$3,000	$3,300	$5,000	$4,000
20,000	M. gal. applying water	.80	1.00	1.00	1.25	1.00	1.10
Lump sum,	finishing roadway	$4,000	$2,500	$3,000	$3,200	$4,000	$2,500
141,000	sq. yd. mix. and compact. (cem. tr. base)	.20	.16	.20	.21	.20	.18
9,900	bbl. Portland cem. (cem. tr. base)	3.35	3.90	3.50	3.66	3.75	3.00
232	ton asph. emuls. (sl. ct. and curing sl.)	26.50	26.00	29.00	30.00	30.00	35.00
145	ton liq. asph. SC-1 (pr. ct. and pen. tr.)	23.00	22.00	24.00	26.00	25.00	25.00
51	ton liq. asph. SC-2 (pen. tr.)	22.00	21.00	25.00	24.00	25.00	24.00
56	ton liq. asph. SC-6 (armor coat)	21.50	20.50	26.00	25.00	25.00	22.00
255	ton sand (pen. tr.)	5.00	4.00	4.15	4.40	5.00	4.50
1,245	ton screenings (armor ct. and sl. ct.)	4.00	4.00	4.40	5.50	4.50	4.50
34,000	ton min. aggr. (P.M.S.)	3.25	3.75	3.65	4.15	4.00	4.20
1,700	ton paving asph. (P.M.S.)	20.00	19.00	18.50	19.00	20.00	18.50
1,100	lin. ft. raised bars	1.25	.80	1.00	1.10	1.00	1.00
3,400	sq. ft. placing P.M.S. (ditch lining)	.12	.35	.04	.22	.20	.20
1,800	cu. yd. Cl. "A" P.C.C. (structures)	42.00	42.50	42.00	41.00	46.00	43.00
313,000	lb. structural steel	.091	.095	.09	.88	.0875	.08
3,330	lin. ft. furn. conc. piling	3.15	3.25	3.15	3.00	3.00	3.25
94	ea. driving piles	75.00	80.00	80.00	77.00	82.00	80.00
25	cu. yd. broken conc. riprap	35.00	6.00	13.50	17.00	5.00	15.00
900	cu. yd. Cl. "B" P.C.C. (curbs)	35.00	40.00	33.00	30.00	37.00	35.00
510	ea. curb dowels	.50	.60	.85	.40	.50	.60
135	ea. right-of-way monuments	5.00	6.00	5.00	5.00	6.00	5.25
23	ea. survey monuments	28.00	23.00	22.00	23.00	30.00	23.00
396	lin. ft. metal plate guard railing	3.60	3.00	3.50	3.00	3.50	3.00
550	ea. instal. guide posts and markers	3.00	2.50	3.50	3.00	4.00	2.50
22	ea. horizontal reflector units	7.50	6.00	7.00	7.50	8.00	8.00
8.6	mi. new property fence	$1,000	700.00	900.00	865.00	$1,200	840.00
6	ea. drive gates (10 ft. wide)	40.00	50.00	33.00	30.00	40.00	65.00
2	ea. drive gates (14 ft. wide)	45.00	55.00	38.50	33.00	50.00	70.00
6	ea. drive gates (16 ft. wide)	50.00	65.00	41.00	34.00	60.00	75.00
2,700	lin. ft. chain link fence	1.27	1.35	1.25	1.20	1.25	1.15
4	ea. chain link drive gates	76.00	60.00	90.00	85.00	62.00	80.00
1,820	lin. ft. 12-in. reinf. conc. pipe (std. str.)	1.90	2.50	1.95	2.30	2.00	2.10
630	lin. ft. 12-in. reinf. conc. pipe (3000-D)	2.00	2.60	2.35	2.50	2.50	2.60
100	lin. ft. 15-in. reinf. conc. pipe (std. str.)	2.70	2.90	2.50	3.00	2.50	3.00
112	lin. ft. 18-in. reinf. conc. pipe (3000-D)	3.85	4.25	4.20	4.40	4.00	4.50
840	lin. ft. 24-in. reinf. conc. pipe (std. str.)	4.90	4.70	4.60	4.70	4.50	4.75
52	lin. ft. 24-in. reinf. conc. pipe (3000-D)	6.40	5.70	4.90	6.00	5.25	6.00
260	lin. ft. 27-in. reinf. conc. pipe (3000-D)	7.00	6.80	6.60	6.90	6.00	7.25
376	lin. ft. 30-in. reinf. conc. pipe (std. str.)	6.40	6.35	5.80	6.50	5.50	6.00
620	lin. ft. 36-in. reinf. conc. pipe (std. str.)	8.05	7.90	7.75	8.20	7.50	8.00
192	lin. ft. 42-in. reinf. conc. pipe (std. str.)	10.20	9.80	9.80	10.30	10.00	10.00
168	lin. ft. 42-in. reinf. conc. pipe (1750-D)	10.60	11.10	10.30	10.80	10.50	10.50
940	lin. ft. 48-in. reinf. conc. pipe (std. str.)	13.00	12.40	12.00	12.40	11.50	12.00
400	lin. ft. 48-in. reinf. conc. pipe (3000-D)	14.25	14.65	14.20	14.70	15.00	14.50
850	lin. ft. 12-in. C.M.P. (16 gauge)	1.90	2.00	1.75	2.00	2.00	1.90
114	lin. ft. 12-in. C.M.P. (14 gauge)	2.10	2.20	2.00	2.20	2.30	2.10
132	lin. ft. 18-in. C.M.P. (16 gauge)	2 70	2.60	2.50	2.75	2.75	2.60
90	lin. ft. 36-in. C.M.P. (12 gauge)	7.90	7.00	7.25	7.60	7.00	7.25
198	lin. ft. 36-in. C.M.P. (10 gauge)	9.50	8.50	8.85	9.10	8.50	9.00
30	lin. ft. 4-in. nonreinforced conc. pipe	1.50	.75	.40	1.10	1.00	.70
752	lin. ft. 8-in. nonreinforced conc. pipe	1.50	.90	.90	1.20	1.10	.75
1,350	lin. ft. 6-in. clay sewer pipe	1.60	1.15	1.45	.95	1.20	1.00
138	lin. ft. 8-in. clay sewer pipe	2.00	1.40	2.00	1.25	1.30	1.10
360	lin. ft. 10-in. clay sewer pipe	2.25	1.70	2.65	1.70	1.50	1.50
246	lin. ft. 12-in. clay sewer pipe	2.65	2.30	3.10	2.10	1.20	2 00
17	ea. spillway assemblies	30.00	23.00	22.00	32.00	25.00	30.00
550	lin. ft. 8-in. C.M.P. down drains	1.65	1.70	1.45	1.80	2.00	1.30
6	ea. salv. spillway assemblies	10.00	6.00	5.50	8.00	10.00	10.00
6	ea. instal. salv. spillway assemblies	15.00	6.00	5.50	8.00	10 00	10.00
172	lin. ft. salv. exist. spillway assemb. downdrains	.75	.25	.65	.55	1.00	.60
168	lin. ft. relay. salv. spillway assemb. downdrains	.90	.25	.80	.55	.50	.60
86	lin. ft. salv. exist. pipe culvert	1.00	1.25	1.00	1.10	1.00	1.00
58	lin. ft. relay. salv. C.M.P. culverts	1.50	1.25	1.00	1.65	.50	1.00
2	ea. salv. exist. manhole frames and covers	14.40	12.00	5.00	11.00	25.00	20.00
2	ea. instal. salv. manhole frames and covers	20 60	35.00	10.00	11.00	25.00	30.00
11	ea. new manhole frames and covers (Type A)	50.00	60.00	44.00	38.00	40.00	40.00
3	ea. new manhole frames and covers (Type B)	50.00	45.00	35.00	29.00	40.00	45.00
82	lin. ft. new manholes	18.50	20.00	25.00	34.00	20.00	25.00
4	ea. adjusting manholes to grade	25.00	35.00	25.00	50.00	25.00	30.00
144	lin. ft. 12-in. welded steel pipe	3.10	6.00	6.90	3.00	2.25	4.00
14,000	lb. misc. iron and steel	.25	.25	.25	.20	.30	.30
210,000	lb. bar reinf. steel	.07	.07	.07	.065	.065	.07
513	lin. ft. steel railing	6.25	6.50	6.30	6.40	6.50	6.75
109	lin. ft. corrugated metal bridge railing	3.00	4 50	2.75	2.40	5.00	3.50
Lump sum,	lighting system (pedestrian undercrossing)	750.00	600.00	570.00	560.00	700.00	800.00
Lump sum,	highway lighting systems	$5,070	$6,500	$5,500	$5,300	$5,600	$5,500
22	ea. spillway assembly downdrain slip joints	15.00	12.00	16.50	18.00	12.00	20.00
24	ea. downdrain pipe anchors	15.00	17.00	22.00	16.00	25.00	15.00

Irrigation . . .

Colorado—Delta County—USBR—Earthwork and Struct.

Crocker & Ellett, Inc., Denver, Colo., with a bid of $137,887, was low before the Bureau of Reclamation for earthwork and structures for enlargement of the Fire Mountain Canal, Sta. 340 to Sta. 686, on the Paonia Project. Unit bids were submitted as follows:

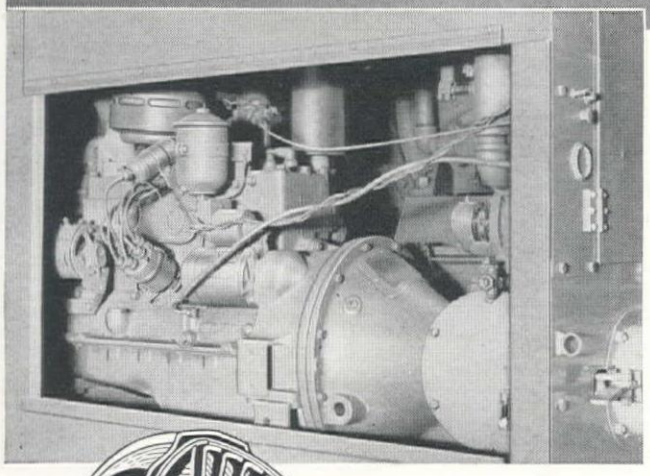
(1) Crocker & Ellett $137,887
(2) Young & Smith Construction Co. 154,381
(3) Western States Contractors, Inc. 157,345
(4) Thornburg Construction Co. 157,800
(5) Gardner Construction Co. $188,325
(6) Schmidt Construction Co. 216,876
(7) Engineer's estimate 138,336

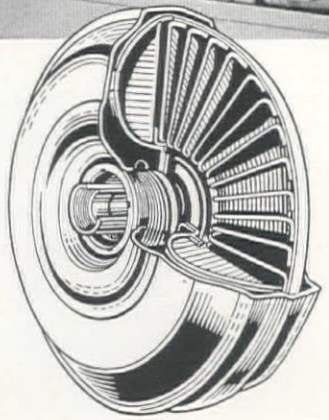
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Lump sum,	removal of exist. structs.	$3,000	$3,500	$1,800	$3,000	$4,000	$4,500	$3,800
130,000	cu. yd. excav., common, for canal	.46	.60	.66	.70	.85	.93	.50
6,800	cu. yd. excav., rock, for canal	1.50	.60	1.00	1.00	.85	.93	2.00
43,000	sta. cu. yd. overhaul	.03	.035	.03	.04	.05	.10	.04
4,000	cu. yd. compacting embankments	.70	.40	.50	.30	1.00	1.00	.60
1,000	lin. ft. relocating and const. farm ditches	.25	.60	1.00	.50	1.50	1.00	.25
250	cu yd. riprap	7.00	8.00	12.00	5.00	8.00	7.50	5.00
3,000	cu. yd. excav., common, for structs.	1.50	2.50	2.00	1.00	3.00	5.00	1.50
150	cu. yd. excav., rock, for structs.	2.00	2.50	3.50	1.00	3.00	5.00	3.00
1,350	cu. yd. backfill	1.00	1.00	1.50	.50	1.00	.75	.50
800	cu. yd. compacting backfill	2.50	6.00	2.00	2.00	2.00	1.50	2.00
1,500	cu. yd. placing earth lining in canal	1.50	2.50	.80	3.00	2.00	2.00	2.00

(Continued on next page)

Smith Leads Again! First to Announce

FLUID DRIVE





Cut-away view of Chrysler Fluid Coupling which provides a safety cushion of oil between power and load. No metal-to-metal contact. Reduces shock load. Prevents stalling.

You naturally look to SMITH for new truck-mixer improvements and developments . . . because SMITH has invented, perfected and introduced so many features that are today regarded as indispensable . . . High Discharge, Feed Chute Loading, Visible Mixing, Controlled Discharge, etc.

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Smith also announces Chrysler 6 cyl. 47 h.p. Industrial Engine as standard equipment on these same three sizes. This means not only tops in engine performance and efficiency, but also country-wide service with replacement parts available everywhere.

Other engines and mixers without Fluid Drive available, if desired.

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1900 — 1950

A 5706-1P

50	sq. yd. dry-rock paving	7.00	6.00	10.00	4.00	5.00	5.00	5.00
330	cu. yd. concrete in structs.	90.00	80.00	70.00	70.00	80.00	92.50	65.00
500	bbl. furn. and handling cement	6.00	6.00	5.35	6.00	6.00	7.50	6.00
34,000	lb. furn. and placing reinf. bars	.15	.15	.18	.16	.14	.20	.15
150	lin. ft. furn. and laying 8-in. diam. conc. pipe	2.50	1.60	4.00	4.00	2.75	2.00	2.50
120	lin. ft. furn. and laying 12-in. diam. conc. pipe	4.00	2.80	6.00	8.00	5.00	3.00	3.65
110	lin. ft. furn. and laying 18-in. diam. conc. pipe	6.50	5.00	10.00	10.00	6.00	4.50	5.80
200	lin. ft. furn. and laying 2-in. galv.-steel pipe for waterline	2.00	1.00	1.50	2.00	3.00	1.00	1.75
11	flumes assemb. and installing 6-in. metal Parshall flume	25.00	20.00	50.00	20.00	25.00	50.00	25.00
12	flumes assemb. and installing 9-in. metal Parshall flume	35.00	25.00	55.00	25.00	25.00	75.00	45.00
4	flumes assemb. and installing 12-in. metal Parshall flume	50.00	35.00	65.00	25.00	35.00	100.00	60.00
20.3	M.b.m. furn. and erect. untreated timber in structs.	240.00	300.00	250.00	250.00	175.00	250.00	250.00
3.7	M.b.m. furn. and erect. treated timber in structs.	300.00	350.00	350.00	300.00	350.00	300.00	300.00
4,000	lb. installing screw-lift gates	.25	.20	.25	.15	.15	.30	.25
1,000	lb. installing miscl. metalwork	.40	.35	.35	.20	.15	.30	.25

Washington—Grant County—USBR—Earthwork and Conc. Lining

Western Contracting Corp., Sioux City, Iowa, with a total bid of $1,649,992, was low before the Bureau of Reclamation for construction of earthwork, concrete lining and structures, Sta. 1410 plus 00 to Sta. 2090 plus 75 of the East Low Canal, and Sta. 0 plus 00 to Sta. 173 plus 65 of the Weber Wasteway on the Columbia Basin Project near Ephrata, Wash. Unit bids were submitted on three schedules as follows:

	Schedule I	Scheule II	Schedule III	Total
(1) Western Contracting Corp.	$471,041	$626,648	$552,293	$1,649,992
(2) J. A. Terteling & Sons	485,514	637,707	683,111	1,805,333
(3) Peter Kiewit Sons' Co.	447,783	653,717	784,307	1,885,807
(4) Vinnell Co.	509,086	714,485	811,274	2,034,846
(5) P. S. Lord	551,993	732,080	.....	.....
— Manson Construction & Engineering Co. and Osberg Construction Co.	.....	.....	744,738	.....
— Haas & Rothschild	.....	.....	834,975	.....
— Scheuman and Johnson	.....	.....	890,554	.....
— Winston Brothers Co.	550,463	762,932	772,954	2,086,349
— Guy F. Atkinson Co.	581,616	834,215	802,846	2,218,677
— Natt McDougall Co.	627,270	828,898	884,981	2,341,149
— C. J. Montag and Sons	.....	.....	1,110,205	.....
(6) Engineer's estimate	571,862	786,939	712,420	2,073,221

Schedule I—East Low Canal, Station 1410 Plus 00 to Station 1767 Plus 00

		(1)	(2)	(3)	(4)	(5)	(6)
1,995,000	cu. yd. excavation, common, for canal	.15	.14	.13	.145	.145	.17
95,000	cu. yd. excavation, rock, for canal	.92	1.16	.75	1.10	1.40	1.15
340	mi. cu. yd. overhaul	.18	.46	1.10	.60	.30	.35
74,000	cu. yd. compacting embankment	.15	.29	.30	.42	.30	.30
6,400	cu. yd. excavation, common, for structures	.40	.41	.90	.60	2.00	.80
170	cu. yd. excavation, rock, for structures	4.00	2.30	3.00	7.00	6.00	4.00
4,500	cu. yd. backfill about structures	.35	.17	.60	.70	.30	.60
2,000	cu. yd. compacting backfill	2.50	2.30	3.00	3.00	2.00	2.75
150	sq. yd. dry-rock paving	3.25	3.88	7.00	6.00	6.00	6.00
220	cu. yd. riprap	6.15	1.15	9.00	4.00	5.50	5.00
70	cu. yd. gravel bedding for riprap	7.10	2.30	15.00	6.00	3.50	3.50
600	cu. yd. concrete in structures	40.00	42.00	58.00	47.50	60.00	60.00
910	bbl. furnishing and handling cement	3.90	5.08	4.50	5.50	4.75	5.00
43,000	lb. furn. and placing reinf. bars in structs	.09	.138	.10	.11	.12	.12
22	sq. ft. furn. and placing ½-in. elastic filler matl. in joints	1.00	1.60	1.00	2.50	3.00	2.00
22	lb. furn. and placing metal water stops in joints	.45	.98	2.50	1.50	1.00	.50
39	M.b.m. furn. and erecting untreated timber in structs.	175.00	144.50	200.00	200.00	145.00	200.00
17	M.b.m. furn. and erecting treated timber in structs.	200.00	204.70	230.00	240.00	195.00	250.00
9	lin. ft. furn. and laying 12-in. diam. std. str. concrete pipe	3.10	2.13	4.00	4.00	2.00	3.00
96	lin. ft. furn. and laying 24-in. diam. std. str. concrete pipe	6.10	4.83	7.00	5.00	4.00	6.00
100	lin. ft. furn. and laying 30-in. diam. std. str. concrete pipe	7.90	6.61	9.00	7.00	5.00	8.00
485	lin. ft. furn. and laying 42-in. diam. std. str. concrete pipe	11.70	11.73	14.00	10.50	12.50	14.00
253	lin. ft. furn. and laying 54-in. diam. extra-str. concrete pipe	16.90	18.00	23.00	18.00	17.00	20.00
165,000	lb. erecting structural steel	.04	.04	.025	.03	.11	.07
6,100	lb. installing gates and gate hoists	.08	.138	.15	.12	.15	.20
800	lb. furn. and installing miscl. metalwork	.50	.75	.65	.50	.40	.50
40	lin. ft. furn. and laying 48-in. dia. std. str. conc. pipe	14.00	16.60	20.00	12.50	17.50	16.50

Schedule II—East Low Canal, Station 1767 plus 00 to Station 2090 plus 75, and Weber Wasteway Turnout

		(1)	(2)	(3)	(4)	(5)	(6)
840,000	cu. yd. excavation, common, for canal	.15	.14	.13	.145	.145	.17
145,000	cu. yd. excavation, rock, for canal	.92	.945	.75	1.10	1.25	1.15
1,880	mi. cu. yd. overhaul	.18	.46	1.10	.60	.30	.35
101,000	cu. yd. compacting embankments	.15	.29	.30	.42	.35	.30
11,000	cu. yd. excav., common, for drainage channels	.25	.20	.30	.40	.32	.25
18,500	cu. yd. excav., common, for structures	.40	.41	.90	.60	.55	.80
570	cu. yd. excav., rock, for structures	4.00	2.30	3.00	7.00	7.00	4.00
8,500	cu. yd. backfill about structures	.35	.17	.60	.70	.20	.60
3,800	cu. yd. compacting backfill	2.50	2.30	3.00	3.00	2.20	2.75
270	sq. yd. dry-rock paving	3.25	3.88	7.00	6.00	2.00	6.00
900	cu. yd. riprap	6.15	1.15	9.00	4.00	5.50	5.00
220	cu. yd. gravel bedding for riprap	7.10	2.30	15.00	6.00	3.50	3.50
2,000	cu. yd. concrete in structs.	40.00	42.00	58.00	48.50	57.00	60.00
3,000	bbl. furn. and handling cement	3.90	5.08	4.50	5.50	4.75	5.00
254,000	lb. furn. and placing reinf. bars in structs.	.09	.127	.10	.11	.11	.11
200	sq. ft. furn. and placing ½-in. elastic filler matl. in joints	1.00	1.60	1.00	2.00	2.00	2.00
670	lin. ft. placing 6-in. rubber water stops in joints	.90	.87	1.00	1.50	1.50	1.50
64	M.b.m. furn. and erecting untreated timber in structs.	175.00	144.50	200.00	200.00	145.00	200.00
28	M.b.m. furn. and erecting treated timber in structs.	200.00	204.70	230.00	240.00	200.00	250.00
16	lin. ft. furn. and laying 12-in. diam. std. str. concrete pipe	3.10	2.13	4.00	4.00	2.50	3.00

(Continued on next page)

"Is it too late, Doctor?"

Sooner or later, one out of every five living Americans may ask his doctor this question about cancer.

THE answer may be: "Yes . . . I'm afraid so . . ."

But, today, the doctor can say to increasing numbers of cancer victims, "No, it is by no means too late . . . There is much that we can do . . . In fact, your chances for recovery are good."

This heartening reply reflects the great progress of medical science against cancer. And there is every reason to believe that, as the years go by, the ancient dream of conquering this disease in all its forms will be realized.

Cancer research supported by the American Cancer Society has already yielded new surgical techniques and improved methods of using x-ray and radium. More recently, research with radio-active isotopes has revealed facts about processes heretofore completely hidden in the body's cells. It has also given scientists new knowledge of hormones and certain anti-cancer drugs — thus making possible more effective control of some types of cancer.

Part of the money you donate will support research that may save millions of lives. Won't you give — and give generously — so that sometime in the future doctors may never have to face another patient and say: "I'm afraid it's too late?"

Remember: Cancer can strike anyone, but you can strike back. There's hope — if you give for research and the other vital activities of the American Cancer Society.

HELP SCIENCE HELP YOU

Join the 1950 Crusade of the

American Cancer Society

MAIL YOUR CHECK TODAY TO "CANCER" IN CARE OF YOUR LOCAL POST OFFICE

92	lin. ft. furn. and laying 15-in. diam. std. str. concrete pipe	3.90	2.82	5.00	4.30	3.00	3.50
60	lin. ft. furn. and laying 18-in. diam. std. str. concrete pipe	4.70	4.49	6.00	4.60	3.50	4.00
60	lin. ft. furn. and laying 24-in. diam. std. str. concrete pipe	6.10	4.90	7.00	5.00	4.00	6.00
112	lin. ft. furn. and laying 30-in. diam. std. str. concrete pipe	7.90	5.58	9.00	7.00	5.00	8.00
426	lin. ft. furn. and laying 36-in. diam. std. str. concrete pipe	10.90	8.90	12.00	9.00	6.00	10.50
500	lin. ft. furn. and laying 42-in. diam. extra str. concrete pipe	11.70	11.90	14.00	10.50	12.50	14.00
243	lin. ft. furn. and laying 54-in. diam. extra str. concrete pipe	16.90	18.30	23.00	18.00	17.00	20.00
238	lin. ft. furn. and laying 60-in. diam. extra str. concrete pipe	21.00	22.54	27.00	25.00	21.00	24.00
109,000	lb. erecting structural steel	.04	.04	.025	.03	.09	.07
78,000	lb. installing gates and gate hoists	.08	.138	.15	.12	.12	.20
4,800	lb. furn. and installing miscl. metalwork	.50	.75	.65	.50	.35	.50
300	lin. ft. furn. and installing elect. metal conduits ¾-inch and less in diam.	1.50	.92	2.00	2.00	1.00	1.75
290	lin. ft. furn. and installing electrical metal conduits 1½ inches in diam.	1.80	1.96	2.50	2.50	1.30	2 00
20	lin. ft. furn. and installing electrical metal conduits 2½ inches in diam.	2.40	2.19	3.50	4.00	1.30	2.50
240	lb. furn. and installing electrical conductors and ground wires	1.90	1.32	3.00	2.50	.30	2.00

Schedule III—Weber Wasteway, Station 2 plus 14 to Station 173, plus 65

		(1)	(2)	(3)	(4)	(6)
434,000	cu. yd. excavation, common, for wasteway	.15	.148	.13	.22	.19
28,000	cu. yd. excavation, common, for structures	.40	.414	.90	.70	60
81,000	sq. yd. trimming earth foundations for concrete lining	.45	.552	1.00	.25	.50
6,000	cu. yd. backfill about structures	.35	.1725	.60	.70	.60
4,200	cu. yd. backfill at top of concrete lining	.45	.115	1.00	.40	.55
4,000	cu. yd. compacting backfill	2.50	2.30	3.00	2.75	2.75
7,000	sq. yd. dry-rock paving	3.25	3.88	7.00	4.50	6.00
120	cu. yd. riprap	6.15	1.15	9.00	4.00	5.00
40	cu. yd. gravel bedding for riprap	7.10	2.30	15.00	6.00	3.50
1,600	cu. yd. concrete in structures	40.00	52.50	58.00	48.50	55.00
13,600	cu yd. concrete in reinforced-concrete lining	7.70	12.07	14.00	18.40	11.00
22,500	bbl. furnishing and handling cement	3.90	5.08	4.50	5.00	4.75
189,000	lb. furn. and placing reinf. bars in structs.	.09	.097	.10	.11	.11
1,212,000	lb. furn. and placing reinf. bars in conc. lining	.08	.09	.09	.10	.09
3,100	sq. ft. furn. and placing ½-in. elastic filler matl. in joints	1.00	1.60	1.00	1.20	2.00
3,000	lin. ft. placing 6-in. rubber water stops in joints	.90	.86	1.00	1.00	1.50
4.4	M.b.m. furn. and erecting untreated timber in structs.	175.00	144.50	200.00	200.00	200.00
14.8	M.b.m. furn. and erecting treated timber in structs.	200.00	204.70	230.00	240.00	250.00
380	lin. ft. furn. and const. 6-in. diam. sewer pipe drains	1.70	1.15	5.00	3.00	1.75
450	cu. yd. placing graded gravel in weephole pockets	11.10	6.44	20.00	16 50	5.00
17,100	lb. furn. and installing 1½-in. galv. pipe for weep holes	.50	.57	.50	.85	.40
111,000	lb. erecting structural steel	.04	.04	.025	03	.07
100	sq. yd. dampproofing railroad culvert	1.20	1.15	3.00	2.00	1.00
720	lb. furn. and installing miscl. metalwork	.50	.75	.65	.60	.50
18,000	compacting embankments	.15	.29	.30	.35	.30

Miscellaneous . . .

Colorado—Larimer County—USBR—Siphon and Access Road

Peter Kiewit Sons' Co., Omaha, Nebr., with a bid of $324,921, was low before the Bureau of Reclamation for construction of the Olympus Siphon, Sta. 57 to Sta. 87, and access road for the Estes Park-Foothills Power Aqueduct of the Colorado-Big-Thompson Project. Unit bids were submitted as follows:

(1) Peter Kiewit Sons' Co. $324,921
(2) Electrical Constructors, Inc. and C. M. Elliott 325,102
(3) Northwestern Engineering Co. 336,777
(4) Western Construction Co. 358,731
(5) Western Paving Construction Co. 383,539
— G. L. Tarlton Contracting Co. $406,665
— Rhoades Bros. & Shofner 424,498
— Peter Seerie, Inc. 455,694
— Gardner Construction Co. 537,223
(6) Engineer's estimate 418,848

		(1)	(2)	(3)	(4)	(5)	(6)
11,800	cu. yd. excavation, common, for structs.	1.00	1.00	1.90	.60	.50	1.00
20,500	cu. yd. excavation, rock, for structs.	1.00	2.60	1.90	2.60	3.15	3.00
29,500	cu. yd. backfill	.60	.40	.30	.50	.50	.50
3,850	cu. yd. compacting backfill	3.00	3.50	2.00	3.90	5.00	3.00
1,100	cu. yd. one-course road surfacing	3.50	3.00	2.45	2.90	4.75	2.00
700	cu. yd. riprap	4.50	4.00	7.00	3.75	8.00	6.00
420	cu. yd. hauling rock to stock piles	2.00	1.60	5.00	.60	1.25	.75
4,300	cu. yd. concrete in structures	35.00	34.00	32.85	32.25	29.80	45.00
690,000	lb. furn. and placing reinf. bars	.13	.10	.12	.13	.16	.13
21,900	lb. furn. and placing metal water stops in joints	.25	.20	.30	.24	.28	.40
26,000	lb. furn. and installing blow-off and vent pipe, fittings, and valves	.20	.20	.46	.47	.72	.65
72	lin. ft. furn. and lay. 24-in. diam. corru. met. pipe	7.00	5.00	6.00	6.00	6.50	5.50
38	lin. ft. furn. and lay. 30-in. diam. corru met. pipe	9.00	6.50	10.00	8.00	8.00	7.50
186	lin. ft. furn. and lay. 42-in. diam. corru. met pipe	15.00	8.00	20.00	12.00	15.00	12.00
300	lin. ft. furn. matls. and const. under-drains with uncemented joints	3.00	3.00	6.00	2.10	1.70	2.00
.02	mi. furn. matls. and const. barbed-wire right-of-way fence	$2,000	$3,000	$2,250	$2,000	$2,000	$2,000
2	gate furn. and installing metal fence gates	40.00	60.00	100.00	65.00	105.00	60.00

Oregon—Morrow and Gilliam Counties—State—Rock Production

Rush Construction Co., Enterprise, Ore., with a bid of $45,240, was low before the Oregon State Highway Department for rock production for the Heppener Junction Lena section of the Heppener Highway. Unit bids were submitted as follows:

(1) Rush Construction Co. $45,240
(2) Newport Construction Co. & Kern and Kibbe 48,546
(3) Barney B. Helser 49,416
(4) Oscar E. Joelson $50,393
(5) F. L. Somers 51,330
(6) E. H. Itchner Co. 52,200

		(1)	(2)	(3)	(4)	(5)	(6)
6,180	cu. yd. ¾-in. - ½-in. crushed rock in stockpile	2.60	2.79	2.84	2 90	2.95	3.00
6,530	cu. yd. ½-in. - ¼-in. crushed rock in stockpile	2.60	2.79	2.84	2.90	2.95	3.00
3,030	cu. yd. ¼-in. - 0-in. crushed rock in stockpile	2.60	2.79	2.84	2.90	2.95	3.00
330	cu. yd. 1¼-in. - ¾-in. crushed rock in stockpile	2.60	2.79	2.84	2.90	2.95	3.00
1,330	cu. yd. 1¼-in. - 0-in. crushed rock in stockpile	2.60	2.79	2.84	2.85	2.95	3.00

NEW EQUIPMENT...

401

Bulldozer Attachment

Manufacturer: Southwest Welding & Mfg. Co., Los Angeles, Calif.

Equipment: Rigid and tilting bowl bulldozer and trailbuilder equipment.

Features claimed: The newly developed bulldozer and trailbuilder equipment for current Allis-Chalmers and Caterpillar tractors is efficient and reliable in all types of operation. The overhead A-frame is eliminated by use of the radiator guard type of mounting. Bulldozers are available in either rigid bowl or tilting bowl types, furnished for either rear or front mounted control units.

402

Heavy Cable Buggy

Manufacturer: Industrial Electrical Works, Omaha, Neb.

Equipment: Series 3000 Powereel.

Features claimed: The Powereel is expressly designed for simplifying the handling of long and heavy electrical cables. An optional 2-wheel hand truck, with a handlebar and separate axle, makes it easy for one man to handle the unit when the reel is loaded to capacity. Power rating is 75 amp. at 220 volts on the collector rings. The Powereel weighs 21 lb. and the hand truck weighs 30 lb. Capacity of the reel is governed by the size cable used: 300 ft. ¾-in. #12 four-conductor cable, or 3,200 ft. of two-conductor shielded microphone lead cord.

403

Fairleader with Large Throat

Manufacturer: American Hoist and Derrick Co., St. Paul, Minn.

Equipment: Steel fairleader.

Features claimed: With a throat large enough to pass a joint made up with Crosby wire rope clips, the fairleader will find wide application where an off-lead is necessary or where more universal swiveling is required than is possible with a snatch block. Sizes are available for ⅝, 1 and 1½-in. wire rope.

404

Hydraulic Cylinders

Manufacturer: Ledeen Mfg. Co., Los Angeles, Calif.

Equipment: Medium Duty Series of air and hydraulic cylinders.

Features claimed: The new line of cylinders is in addition to the Heavy and Super Duty series now being manufactured by Ledeen for use wherever straight line motion is used. They utilize tie-rod construction to give positive protection against leakage at joint of tube and head. Various head and rod attachments provide for almost all mounting requirements.

405

Insulation Gun

Manufacturer: Conair Sales, Inc., North Hollywood, Calif.

Equipment: Pneumatic gun to apply liquid building insulation.

Features claimed: Recently approved by the Los Angeles Building Commission, the Conair process consists of spraying a mixture of cement, water, insulation, waterproofing, and other ingredients against steel building forms to make a completed wall or ceiling. Standard wall thickness is 4 in., with 3 in. for partitions. Interior walls may be papered, painted, or paneled.

NEW EQUIPMENT

MORE COMPLETE INFORMATION of any of the new products or equipment briefly described on the following pages may be had by sending your request to Equipment Service, Western Construction News, 609 Mission Street, San Francisco 5, Calif. For quicker service, please designate the item by number.

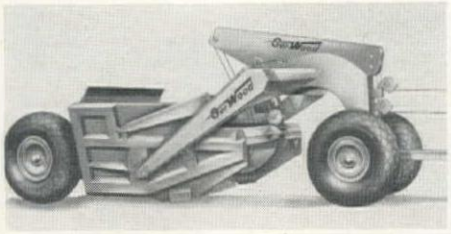
406

Four-Wheel Scraper

Manufacturer: Findlay Division of Gar Wood Industries, Inc., Findlay, Ohio.

Equipment: Model 625 open bowl scraper for the Allis-Chalmers HD-19.

Features claimed: The cable-operated scraper has capacities of 24.5 cu. yd. heaped



and 19.2 cu. yd. struck, and maintains the proven bowl and gate proportions used in the Gar Wood 500 series scrapers. Engineered for use with the Allis-Chalmers HD-19, the scraper has an apron opening of 78 in., ample to eject sticky materials and large rocks. Through-axle box construction, with axle spindles inserted in the ends, provides easy removal and servicing of tires, wheels, and bearings. Three tire options are offered. A positive traveling lock is conveniently located between the frame and yoke for roading the scraper between jobs. A simple power tongue lifting device is welded to the side of the tongue to raise the tongue by cable for hitching the scraper to the tractor. A unique double-reinforced bowl bottom is provided to resist twisting shocks and strains. Bowl side stiffeners are tapered for self cleaning.

407

Crawler Crane-Excavator

Manufacturer: Manitowoc Engineering Works, Manitowoc, Wis.

Equipment: Model 4500 5½-cu. yd. shovel, crane, and dragline.

Features claimed: Designed for mobility, model 4500 has air controls for all operating clutches and brakes, straight Diesel power and crawler drive. If required, loading or unloading from trailer or flat car can be done in 3 to 5 days, with the machine handling its own heavy components. Job speed is 0.77 mph., with a ground bearing pressure as low as 9.6 p.s.i. Standard crawlers are 25 ft., 9 in. long, 21 ft. wide, and with a choice of 48 or 60-in. pads. Steering is air controlled, permitting locking of either crawler for short radius turns. Shovel booms are available in lengths of 38 ft., 6 in., with 27-ft. stick and 5½-cu. yd. dipper, up to a 60-ft. boom with 45-ft. stick and 4½-cu. yd. dipper. The dipper stick is a single tubular unit which rolls through the saddle on concave rollers, free to turn without transmitting twisting stresses to the boom. Crowd and retract mechanism is independent cable type. Double lines are driven from a drum mounted on the boom, and have no reverse bends. Optional dragline and clamshell boom lengths vary from 100 to 140 ft., with the upper 75 to 95 ft. constructed of aluminum alloy. All-steel lift-crane booms are available in lengths from 87 ft. up, with crane rated lifting capacity of 100 tons at 20-ft. radius.

408

Wagon Drill

Manufacturer: Schramm, Inc., West Chester, Pa.

Equipment: Model WDR-126 wagon drill.

Features claimed: The tool is equipped with a 4-in. drifter, and will drill holes at any angle or direction to a depth of 24 ft. or

more. Flat holes can be drilled between 2 in. and 9 ft. above ground. Air feed is continuous, without a guide shell or change by hand setup necessary in order to get a full steel change. Another feature is a built-in twin jack-screw mechanism through which the U-bar is raised or lowered to desired position. Main wheels swivel 90 deg. for line drilling and 180 deg. to obtain a narrow tread for confined spaces.

409

Windrow Eliminator

Manufacturer: Tractomotive Corp., Deerfield, Ill.

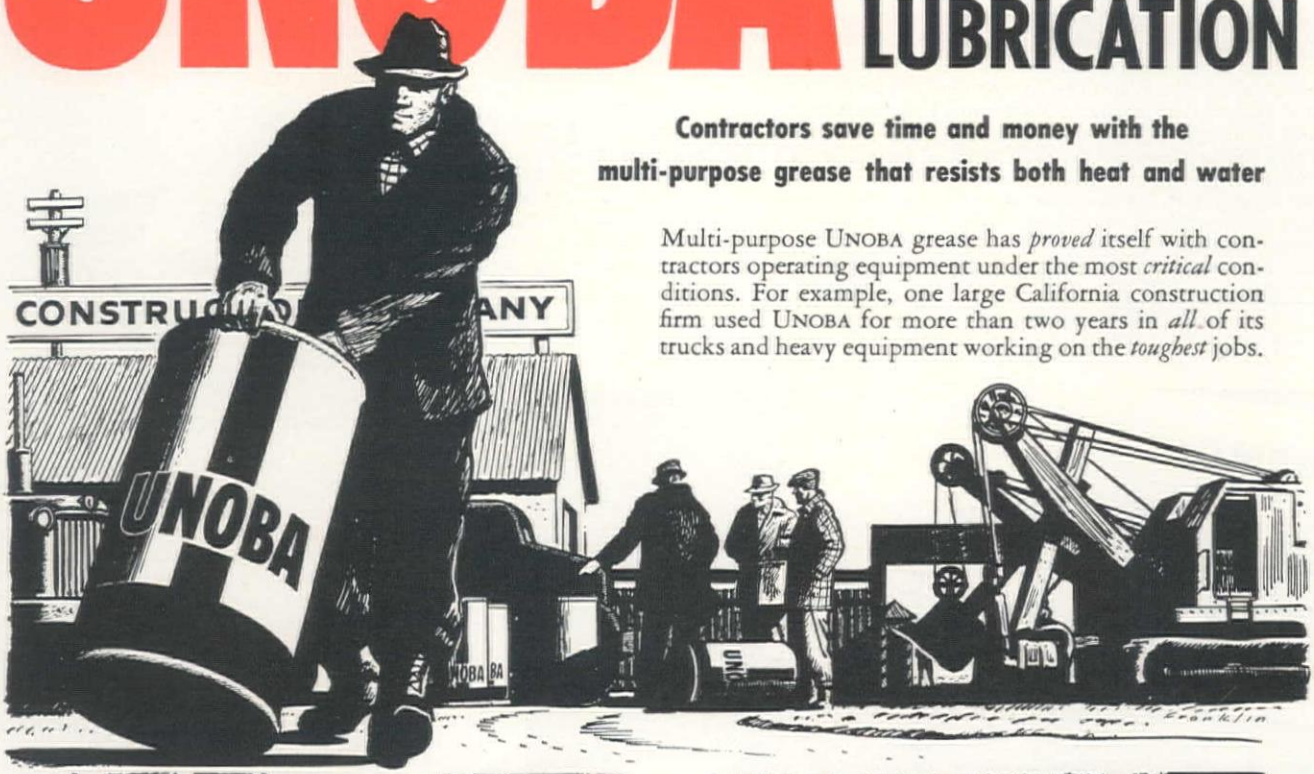
Equipment: Attachment to feather out the windrow that can be attached to the Allis-Chalmers' Model D motor grader.

Features claimed: The blade attachment clears off excess material which the grader moldboard usually piles up along the road's edge. Constant control is easily maintained because the eliminator rides on its own wheels, and blade settings are not affected by up and down movement of the grader. The unit is easily mounted on the grader

UNOBA SIMPLIFIES LUBRICATION

Contractors save time and money with the multi-purpose grease that resists both heat and water

Multi-purpose UNOBA grease has *proved* itself with contractors operating equipment under the most *critical* conditions. For example, one large California construction firm used UNOBA for more than two years in *all* of its trucks and heavy equipment working on the *toughest* jobs.



According to this contractor,* *no* bearing failures occurred. And the replacement of parts was *not* necessary, due to UNOBA's high lubricating quality. Also, the multi-purpose feature of UNOBA grease eliminated the necessity of keeping four or five types of greases on hand.

**Name available upon request.*

Just what is UNOBA? Union Oil's exclusive UNOBA is a *barium* base grease that resists *both* heat and water. It sticks to metal surfaces with a tenacity that boiling water can't break! And it gives thorough protection at temperatures from below freezing to over 300° F.

Because of this flexibility, UNOBA *simplifies* lubrication. It performs on jobs formerly requiring *many* different types, grades and brands of grease. This results in reduced inventories, smaller storage space, less chance of using the wrong lubricant, and lower maintenance costs to you.

For *full* information, call your local Union Oil Representative, or write Sales Department, Union Oil Company, Los Angeles 17, California.

76 UNION OIL COMPANY OF CALIFORNIA

frame. The unit operates off the grader hydraulic system and can be easily raised and lowered to suit maneuvering requirements.

410

Automatic Paver Water System

Manufacturer: Worthington Pump and Machinery Corp., Harrison, N. J.

Equipment: Automatic, hydraulically controlled water system for Worthington-Ransome 34E Dual Drum Pavers.

Features claimed: The automatic system is now standard equipment for the Model 34E, and is designed to simplify operation of the machine and to assure a more uniform mix. The possibility of wet or dry batches due to carelessness is eliminated. The automatic system goes into operation when the skip is 4 ft. off the ground, and closes the water valves completely when the required amount of water has entered the drum. An automatic water cutoff delaying action, adjustable to a maximum of 12 seconds, eliminates the need for the paver operator to hold the skip up until the proper quantity of water has been discharged.

411

Molybdenum Lubricant

Manufacturer: The Lockrey Co., College Point, N. Y.

Equipment: A metal molybdenum lubricant to take the place of, or supplement, regular lubricants.

Features claimed: Molybdenum is an extremely "greasy" metal, practically indestructible at high temperatures and pressures, certain forms of it having the peculiar faculty of "plating" itself firmly to any friction surface. This forms a permanent friction-supporting film which cannot be "squeezed out" by any amount of pressure, thus protecting the bearing against scoring or seizing even after all the oil has been burned out. The new molybdenum-base lubricant is called "Liqui-Moly."

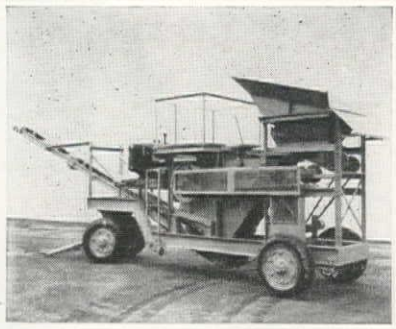
412

Portable Crushing Plant

Manufacturer: Iowa Mfg. Co., Cedar Rapids, Iowa.

Equipment: Plant made up of standard Cedarapids units and especially designed as a low investment machine for moderate sized crushing jobs.

Features claimed: Recommended for use where the material is screened into only one size, the plant can be set up close to



the job site to eliminate high hauling costs. Extremely low operating costs and plant maintenance are claimed to be the result of simple design. The plant consists of a reciprocating, clutch-controlled feeder and 6 by 6 ft. charging hopper with adjustable feed gate; a Cedarapids single deck horizontal vibrator screen; a Cedarapids jaw crusher, and a 25-ft. delivery conveyor. All units are mounted on a steel wheeled or pneumatic tired truck.

413

Detachable Gooseneck Trailer

Manufacturer: Rogers Brothers Corp., Albion, Pa.

Equipment: Heavy-duty trailer with removable gooseneck to facilitate rapid, easy loading and unloading.

Features claimed: A cable-operated ram lowers the front of the trailer to the ground for detachment of the gooseneck to permit easy loading or unloading of equipment over front of trailer. The gooseneck can be detached, the trailer loaded, and the gooseneck re-attached in 5 minutes. Other features of the design of the trailer make possible the lowering of the trailer deck when loaded to clear overhead obstructions, and the raising of the deck to clear roadbed obstructions. The detachable gooseneck feature is available on most Rogers trailers from 15-ton capacity up.

414

Improved "Gradall"

Manufacturer: The Warner & Swasey Co., Cleveland, Ohio.

Equipment: New design features to increase the earthmoving efficiency of the Gradall.

Features claimed: Width of the circular roller path around the circumference of the main turntable has been increased, permitting the use of larger bearing rollers. Eight rollers now share the load instead of four. Relocation of the valve manifold has permitted the redesign of the operator's cab. A 2,000-lb. counterweight at the inboard end of the main boom balances the extended portion of the telescoping boom and increases its lifting capacity. The boom extension now rides on five rollers. All cylinders have been redesigned for longer life and simplified maintenance. The Gradall is

now offered with a Diesel power unit as optional alternate to a gasoline engine.

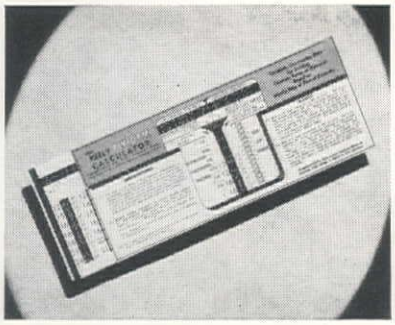
415

Plywood Form Calculator

Manufacturer: Douglas Fir Plywood Association, Tacoma, Wash.

Equipment: Keely plywood calculator.

Features claimed: The instrument provides quick, easy specification data on proper plywood thickness, spacing and size



of studs, wales, and ties, as based on hourly rate of pour. Operated as a slide rule, it calculates for both vibrated or unvibrated concrete at both 50 and 70 deg. F. The 3 x 8-in. plastic calculator, with a folder of design assumptions, is available for one dollar.

416

Utility Hydraulic Hoist

Manufacturer: Unit Manufacturing Co., Minneapolis, Minn.

Equipment: The Utility, ¾-ton shop and truck hoist.

Features claimed: The "Utility" can be used on a 3-wheel tubular steel floor frame, or converted for use on truck beds, work benches, and loading docks. It features fast hydraulic operation that will lift a ¾-ton load 77 in. in 45 seconds; or with a short hook-up, one ton can be lifted 52 in. in 45 seconds. A double action, hand operated hydraulic pump powers the hoist. When mounted on a truck, 45-in. boom swings in full circle, and when on floor frame, a special locating pin locks hoist in safe working position.

417

Vinyl Plastic Coating

Manufacturer: James Lithgow Co., Inc., Los Angeles.

Equipment: "Calvinac" ready-mixed abrasion and corrosion resistant coatings.

Features claimed: The coating can be applied to wood or metal by brush, spray, or dipping. It is air drying and non-toxic, highly dielectric, and resistant to alcohol, acids, salts, alkali, and fumes. "Calvoseal" is a Calvinac coating created particularly for concrete, masonry, asbestos, plaster, and similar products. It dries with the evaporation of water, and once dry, is impervious to moisture penetration. No preparatory coating is necessary. Both products are available clear or in colors.

418

Vacuum Leaf Loader

Manufacturer: M. A. Elliotte, Grafton, N. Y.

Equipment: Front and rear end units of the Vacuum Leaf Loader and Street Cleaner.

Features claimed: The Leaf Loader is a 2-wheeled trailer assembly that can be quickly connected or disconnected from the truck. When in operation, the vacuum cre-

ated by the blower will suck up all the leaves, wet or dry, from the street. The leaves pass through the blower and are blown into the collecting truck. Dirt and dust normally associated with conventional raking methods are eliminated. Results show that the equipment can load 5,700 lb. of leaves into a 24-cu. yd. collecting truck. Two men, loader operator and truck driver, are required to operate the Loader. Truck body extensions can be built for any size dump truck in such a manner that both front and rear end models can be removed and the truck used for other purposes.

419

Vibrator Improvement

Manufacturer: Viber Co., Burbank, Calif.

Equipment: Viber clamp.

Features claimed: The latest improvement in Viber vibrators is a new clamp arrangement between the driving unit and flexible drive. A squeeze ring does away with the slot milled in the old style clamp, giving greater strength to the new unit.

420

Elevating Grader

Manufacturer: Ulrich Products Corp., Roanoke, Ill.

Equipment: Attachment for "Caterpillar" Diesel motor graders.

Features claimed: Trade named "Domor," the attachment converts a Caterpillar Diesel motor grader into a one-man self-propelled elevating grader. In making the conversion, the standard blade, circle, and drawbar are removed, and the elevating carrier adjustably supported under the main frame. A 30-in. disk plow is drawn by a plow beam attached to the standard drawbar connection. The 42-in. carrier is driven by power takeoff from the grader engine and has a normal speed of 400 ft. per min. Ball bearing mounted carrier rollers carry the 4-ply corrugated top conveyor belt. The standard carrier for the 6,000-lb. attachment is 19 ft. in length. For casting work, a 3-ft. section can be removed. The machine and attachment were designed to give production comparable to a 42-in. pull-type elevating grader.

421

Flow Gage

Manufacturer: Fischer & Porter Co., Hatboro, Pa.

Equipment: Magna-Sight flow gage.

Features claimed: The unit consists of a short body, with flanged or screwed pipe connections, to accommodate a fixed orifice

in the lower end. A tapered metering plug rises and falls with fluid flow rate in accordance with variable-area metering principles. The gage is available in sizes from ¾-in. to 4 in., with maximum capacities from 3.5 to 250 g.p.m. It can be used for clear and opaque liquids, slurries, and the accuracy averages about 5% over the scale range. Temperatures up to 400 deg. F. and pressures up to 500 p.s.i. gage can be accommodated.

422

Safety Drop Hook

Manufacturer: Coffing Hoist Co., Danville, Ill.

Equipment: Mechanical drop hook with toggle action.

Features claimed: The hook is capable of lifting, hauling, and releasing any weight as simply as a man handles a 1-lb. weight. The 6,000-lb. model, weighing 2¼-lb., is now in production, and requires a 40-lb. pull on the release lever to unload. The side plates of the hook are aluminum alloy, and the load bearing hook, cams, and levers are of high tensile steel.

423

Magnesium Wall Forms

Manufacturer: Symons Clamp and Mfg. Co., Chicago.

Equipment: Magnesium forms that will prove cheaper for contractors who specialize in concrete foundations.

Features claimed: The magnesium forms will last longer, go up faster and do a better and more satisfactory job than lumber or plywood forms. Weight is less than 3 lb. per sq. ft.; panel, of course, does not swell when wet; will not rust, are precision made, and can be rented at the same price

as plywood forms. "Facing" leaves no waves or dents in the concrete when solidified.

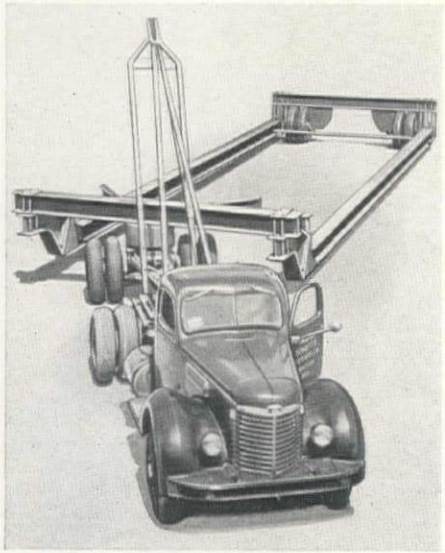
424

Big Frame Trailer

Manufacturer: Schuette Builders Co., Wausau, Wis.

Equipment: The 50-ton Super-Hauler trailer.

Features claimed: The complete trailer is built of five basic elements, readily assembled under any load to be moved. Main frame girders are separate units and are easily placed in any desired position under a house, building, or large fabricated assembly after clearance is provided. The



heaviest section of a structure can be supported at its critically weighted point, without resorting to leveling timbers. Once the trailer frame has been placed under the load, the complete frame and burden are raised in a single effort, and adjustable pneumatic-tired wheels are placed in position on the cross beams. No movement of building to the trailer is necessary. A 3-point weight distribution is made possible by using a semi-trailer type fifth wheel on the front cross-bar section of the trailer frame. Instead of moving parallel to the trailer frame, a rocker shoe of the fifth wheel rocks laterally, at right angles, to the frame. This arrangement permits the right and left rear wheels to rise and fall without excessive distortion to the frame.

425

One-Cu. Yd. Crane-Excavator

Manufacturer: Marion Power Shovel Co., Marion, Ohio.

Equipment: The Marion Type 43-M.

Features claimed: With various front-end combinations, the 43-M serves as a shovel, dragline, clamshell, crane, backhoe, and pile-driver. Simplicity of design eliminates the need for machinery, lagging, or sprocket changes when making quick front-end changes in the field. A single boom can serve for both shovel and backhoe work, but a gooseneck boom is available as optional equipment for owners who prefer it for backhoe service. A single boom, with butt-jointed sections, is used for dragline, clamshell, crane, or pile-driver service. Other features include accessible machinery, with only two horizontal shafts on the entire machinery deck; independent chain crowd; air control system; independent boom hoist with overrunning clutch; holding brake and safety ratchet as standard equipment; and lubrication fittings grouped

at points of easy access. Machinery supports are built integrally with the upper frame to assure permanent machinery alignment.

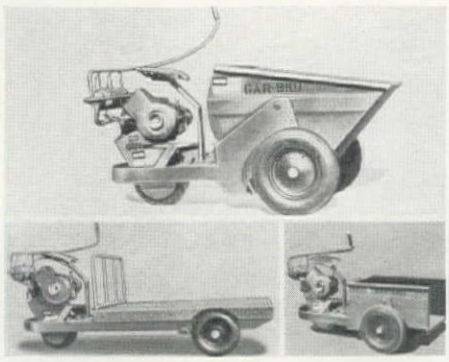
426

New Trays for Power-Cart

Manufacturer: Gar-Bro Manufacturing Co., Los Angeles.

Equipment: Improved Gar-Bro Power-Cart featuring three interchangeable trays.

Features claimed: Capacity of the improved model is 2,000 lb. or 14 cu. ft. It



travels at speeds up to 10 m.p.h., and climbs 20% grades with capacity load. The newly designed bulk handling tray is balanced on trunnions at each side. It dumps or pours under the complete control of the operator. A trip-latch releases the tray and a tilt-brake holds it at any pouring angle. Bulk tray, box, or platform tray can be interchanged in less than five minutes. Steering and power control are by tiller. When held in a downward position, the tiller engages the 7-hp. engine in forward, and when held in an upward position, engages the reverse. Releasing the tiller automatically disengages the power. Speed is controlled by a foot throttle. The single rear wheel permits U-turns within a radius of 4 ft.

427

Truck Mixers

Manufacturer: Ransome Construction Equipment Division of Worthington Pump and Machinery Corp., Harrison, N. J.

Equipment: New line of Worthington-Ransome light-weight truck mixers.

Features claimed: The truck mixers have a patented, pressed blade design, which gives fast and clean discharge of lowest slump concretes. Fast charging is permitted through a large, unrestricted hopper opening. Mixing is fast and thorough. Convenient, easy handling controls and unusual ease of operation allow more yards per hour. All operating parts requiring maintenance are easily accessible.

428

Asphalt Surface Heater

Manufacturer: Asphalt Maintenance Co., New York City.

Equipment: Heater designed for resurfacing of sheet asphalt, rock asphalt and plantmix.

Features claimed: The manufacturer states that, with this heater, worn and corrugated pavements can be restored to their original efficiency with a saving of approximately 35%. The heater is used to prepare the surface of old pavements for removal by the application of intense heat. The unit is mounted on a specially built 2½-ton Diamond T truck chassis. All operating parts of the unit are completely enclosed within the rigid steel body which houses the fuel oil tank, gasoline tank, engine, blower, pumps and hydraulic hoist. With one heater, it is possible to remove to an average depth of one inch 3,000 sq. yd. of asphalt pavement in 8 hr.

429

Self-Priming Portable Pump

Manufacturer: McCulloch Motors Corp., Los Angeles.

Equipment: Light-weight pump rated at 15,000 gal. per hour output.

Features claimed: Made of cast aluminum, the pump is light enough to carry about (see cut). It is powered by a 5-hp.

engine. The centrifugal-type pump has a 28-ft. suction lift. A non-clogging impeller is mounted directly on the engine shaft. The manufacturer claims that the weight of the pump is approximately one-half that of pumps with the same capacity now on the market.

430

Rock Drill Mountings

Manufacturer: Independent Pneumatic Tool Co., Aurora, Ill.

Equipment: Three power feed mountings for Thor drifter rock drills.

Features claimed: The three units are all designed for use with Thor Model 82 and 92 drifter rock drills, and are equipped with sliding cones that double automatically the length of feed. Largest size in the new line is the model RF-96, with a total extension of 96 in., 48 by means of the power feed and 48 by means of the sliding cone. An aluminum shell provides the desirable light weight on the large size mounting. Other models provide feeds of 48 and 60 in. All models are powered with an air motor which provides power feed operations with a minimum of vibration. The rotor and blade construction insure positive and slow starting torque in every situation.

431

Packaged Steel Buildings

Manufacturer: H. D. Campbell Co., Rochelle, Ill.

Equipment: Prefabricated field office, garage, machine shed.

Features claimed: The packaged steel buildings can be erected by the purchaser himself without special tools or skills. The line includes laying houses, storage warehouses, garages and machine sheds, avail-

able in widths to 24 ft. in any desired length. Features include paneled gables and die-formed eaves, U-channel draw type connectors, and complete insulation. Side doors are in 8-ft. sections, either 6 or 8 ft. high. The buildings are available in steel or aluminum, galvanized or painted with heavy base gray.

432

One-Yard Shovel-Crane

Manufacturer: The Thew Shovel Co., Lorain, Ohio.

Equipment: The Lorain-50 power shovel-crane.

Features claimed: The power takeoff is by means of a twin-disc hydraulic coupling, which prevents stalling the engine from overloads. The swing clutches have been

given special consideration, and are wider floating anchor shoe-type to give more complete band contact and improved pressure distribution. Interchangeable boom equipment is as follows: 21 and 19-ft. shovel booms, all welded and with independent chain crowd, with 17-ft. dipper stick; standard two-section crane boom; and clamshells, lifting cranes, draglines, and hoes. Four crawlers of various widths and lengths are available. All are chain driven, with 4-way tread and travel lock, and equipped with 30-in. treads.

433

Mortar Mixer

Manufacturer: Kwik-Mix Co., Port Washington, Wis.

Equipment: Models 6-P and 10-P plaster-mortar mixers.

Features claimed: Outstanding improvement on the smaller 6-cu. ft. model makes it possible to reduce overall width to 33 in. This allows the machine to be moved through standard width doorways, for indoor operation. The machine's standard width of 44 in. is easily reduced by removing four bolts and telescoping the axle to the 33-in. width. Major improvement in the 10-P model is the addition of an automatic water-measuring tank. This is a self cleaning device that delivers the correct volume of water into every batch. With a capacity of 10 gal., the tank is accurate to a fraction of a pint, whether or not the machine is on level ground.

434

Rubber Pads for Crawlers

Manufacturer: Metalweld, Inc., Philadelphia, Pa.

Equipment: Metalweld rubber pads.

Features claimed: The process used by Metalweld vulcanizes resilient rubber to steel plates. When these plates are bolted to crawler pads, pavers can move over finished concrete without damage to the surface. Using the B. F. Goodrich Vulcalock bonding process, the rubber and steel are

bonded with a strength of 500 p.s.i. Rubber pads eliminate the necessity of relaying belting in front of the paver crawlers.

435

Anti-Rust Paint

Manufacturer: Speco, Inc., Cleveland, Ohio.

Equipment: Paint that can be brushed or sprayed directly over rust without wire brushing or scraping.

Features claimed: Rustrem Clear, a clear anti-rust paint, can be painted over with any good quality paint (except lacquer). It will not bleed through painted surfaces. It is ideal for use as a rust-proofing primer and undercoater.

436

Light-Duty 4-Wheel Drive Truck

Manufacturer: Four Wheel Drive Auto Co., Clintonville, Wis.

Equipment: An FWD model with a gross vehicle weight of 14,500 lb.

Features claimed: The field of light-duty trucks has previously been served only by conventional rear-drive trucks. Up to now, the FWD model range has been from 17,000 to 58,000 lb. gross vehicle weight. The new Model LD will have its place in off-the-highway service, and also is said to have high efficiency on the road.

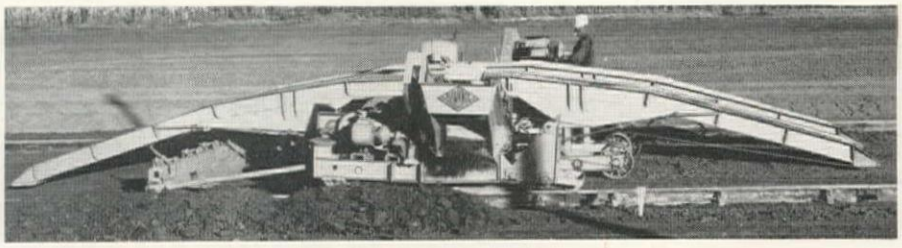
437

Load Binder and Puller-Jack

Manufacturer: The Nolan Co., Bowerston, Ohio.

Equipment: Puller jack that can be quickly set up and used in any position.

Features claimed: The jack operates upright, sideways, or upside down, with lever pull away from load or toward it. The mechanism will not clog with dirt, gives positive action and always holds. A feature claimed by the manufacturer is that it is the only puller that pulls for the entire chain length at one hold.



438

Vibratory Subgrader

Manufacturer: Blaw-Knox Co., Pittsburgh, Pa.

Equipment: Blaw-Knox vibratory subgrader.

Features claimed: The model (see cut) can be used for road widths from 20 to 25 ft., and is equipped with a cross-over bridge for batch trucks. A method of insulation and control directs the 2,000 vibrations per minute into the ground without transmitting shock or movement into the road forms. The warping of the subgrade from flat to crown, or reverse, can be accomplished without stopping for forward motion. Batch trucks can traverse the pass-over while the machine is in motion. Cutting blades can be quickly adjusted.

439

Fluted Masonry Drill

Manufacturer: Carboloy Company, Inc., Detroit, Mich.

Equipment: Carbide masonry drill with spiral flute on shank.

Features claimed: The high tensile wire applied to the shank as a spiral flute makes the drill cut faster, without the necessity of withdrawing in order to remove dust. Pressure required on the Carboloy wire "live-"spiral" masonry drill is no greater at the end of a deep hole than at the start. Ten diameter sizes are available, ranging from ¼ to 1 in.

440

Hydraulic Scoop-Shovel

Manufacturer: Yale & Towne Mfg. Co., Philadelphia, Pa.

Equipment: Scoop that handles 27 cu. ft. for attachment to the Yale & Towne Lift King and Worksaver electric and gas fork trucks.

Features claimed: The scoop, hydraulically-operated, tilts upward from the horizontal scooping position to cradle the load during transport, and tilts downward to completely discharge the load when dumping. The device scoops at the ground level or digs into piled material. It dumps, loads

into bins, vats, hoppers, mixers, and other receptacles at heights up to 130 in.

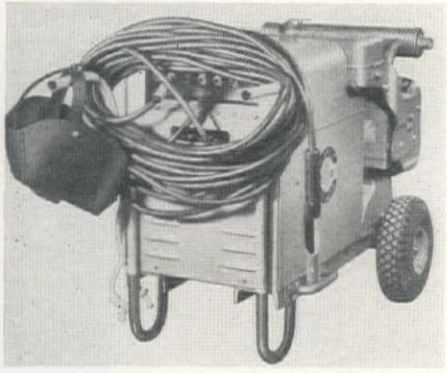
441

Arc Welder and Power Plant

Manufacturer: Miller Electric Mfg. Co., Appleton, Wis.

Equipment: Engine-driven combination AC arc welder and 3-kw. power plant in two models.

Features claimed: Both models are ideal for welding, pipe thawing, or service as 3-kw. power plants. The "L" is the sta-



tionary model, and the "L-P" is a completely portable unit on a rubber-tired truck. Both will handle all AC and AC-DC electrodes from 1/16 to 3/16-in., and deliver 200 amp. welding current. For power, the machine provides 3-kw., 110/220-volt AC, single phase, at 60 cycles. A simple switch enables the operator to change from welding to power plant operation. The generator is powered by an Onan two-cylinder four-cycle air-cooled engine.

442

Load Binder

Manufacturer: The Canton Cast Products Co., Canton, Ohio.

Equipment: The Canton Tension-Pull Load Binder that is guaranteed against breakage or spreading of the clevis.

Features claimed: The binder is made of alloy castings with drop forged hooks. Further guarantee against overstraining is its revolutionary continuous load take-up feature—loads can be quickly bound and tightened without the use of chain falls or other similar equipment. Through compound leverage action, one man exerts up to 4,500 lb. pull on the chain without the use of an extension pipe.

443

Concrete Mixing Plant

Manufacturer: SuPremix, Inc., Adrian, Mich.

Equipment: SuPremix "package" central mixing plant.

Features claimed: The plant is offered in either standardized designs or with tailored engineering to fit individual requirements. The tilting mixer is furnished complete with supporting frame structure. Because of its new tilting arrangement, the mixer is located much lower in the structure, saving headroom and giving lower height. A Plastograph automatically signals the consistency of the concrete in the mixer before the end of the mixing cycle, giving the operator time to make a correction in the mix if necessary. This accuracy allows the discharge of load after load of specified slump concrete. The concrete dumper is designed to move the bottom materials first when dumping, effecting complete discharge and uniform consistency.

444

Pipe Bender

Manufacturer: Tal Bender, Inc., Milwaukee, Wis.

Equipment: Tal Handy Bendy.

Features claimed: The equipment makes any number of uniform bends, including offsets in ½ and ¾-in. rigid, thin wall, or aluminum conduit. A measuring gage and bend degree indicator are built in. Weight of the bender is 30 lb.

445

Low Tilt-Type Trailer

Manufacturer: Martin Machine Co., Kewanee, Ill.

Equipment: Martin Model 333 Carryhaul trailer.

Features claimed: Model 333 is built 16 in. from ground to platform, offering considerably greater clearance for low viaducts and overhead obstructions, and is an extremely low-slung version of the model 222 trailer. The trailer features a lower center of gravity and a smaller angle of incline, permitting easier loading of crawler equipment, rollers, and machinery that is not self-propelled.

446

Water-Repellent Coating

Manufacturer: Ranetite Mfg. Co., Inc., St. Louis, Mo.

Equipment: Ranetite No. V transparent coating.

Features claimed: The new No. V contains poly-Siloxane resin, a chemical widely used in the manufacture of many water-repellent coatings. This water-repellent coating is of a transparent nature, and is

used to render outside masonry walls, above grade, impervious to water and water vapor.

447

Semi-Rigid Plastic Pipe

Manufacturer: Carter Products Corp., Cleveland, Ohio.

Equipment: Carlon "T" plastic pipe.

Features claimed: The pipe is guaranteed against rot, rust, and electrolytic corrosion,

and will not form a galvanic couple. It is not damaged by freezing water and can be installed above or below frost level. Sections are connected by means of cement-treated plastic sleeves, and connections to metal pipe with standard fittings are made with threaded plastic sleeves.

448

White Portland Cement

Manufacturer: Calaveras Cement Co., San Francisco, Calif.

Equipment: White Portland cement.

Features claimed: The company reports that the new product exceeds all federal and ASTM specifications for type 1 Portland cement, is non-staining, waterproof, and uniformly white. In recent years, the entire plant has been used for the manufacture of gray cements to meet increased postwar demands. A $2,250,000 plant expansion program has been under way to provide the facilities required for simultaneous production of the white and gray cements. Availability of a Western-made white cement is expected to effect considerable freight savings for contractors in the West.

449

Motor Oil Detergent

Manufacturer: Power Ball Oil Co., Inc., Columbia, S. C.

Equipment: Power Ball "friction-proof" lubricating additive.

Features claimed: When used with any oil or grease, the additive forms a microscopic and tough film that penetrates into the pores of and protects the surface from corrosion. It increases the life and efficiency of both lubricating and cutting oils, and acts as an effective detergent.

450

Power Wheelbarrow

Manufacturer: Koehring Company, Milwaukee, Wis.

Equipment: Model 1950 Moto-Bug.

Features claimed: Principal improvement noted in the 1950 model Moto-Bug, Kwik-Mix power wheelbarrow, is a large steering wheel to replace the lever bar arrangement formerly used for guiding the unit. Steering gear ratio has been increased from 2:1 to 4:1. The 10-cu. ft., 1,200-lb. unit is powered by a 4-hp. gasoline engine, and has speeds up to 4 mph. in both directions. A direction indicator is also included with the new steering feature.

451

Belt Sander

Manufacturer: Mall Tool Co., Chicago, Ill.

Equipment: Two-drum, 8½-lb. belt sander.

Features claimed: Power beyond ordinary requirements is provided by the sander, which can be used on all woods,

metals, and plastics. Weight of the 2-drum sander is 8½ lb., and the sanding area is 3 x 5½ in. The tool is flushed to the right, making it ideal for sanding corners and upright objects. A pedestal stand is available to convert the belt sander to a bench sander.

452

Booster Clutch

Manufacturer: Koehring Co., Milwaukee, Wis.

Equipment: Mechanical booster clutch for Koehring Model 304 excavator.

Features claimed: A clutch that reduces lever pull more than 50% for the operator has been developed for use on the Model 304 ¾-cu. yd. excavator. The reduction in operating effort is made possible with a clutch design of two separate load-carrying clutch bands, one of which helps to set the other. By actual measurement, only ⅓ to ½ the effort formerly required will allow the new clutch to produce engine stalling loads. Full efficiency at all times is attributed to a heat compensator spring that changes tension automatically.

453

Masonry Preservative

Manufacturer: Protection Products Mfg. Co., Kalamazoo, Mich.

Equipment: Invisible Rainchek silicone preservative.

Features claimed: The completely colorless product penetrates deeply into cement blocks, concrete, brick, unglazed tile, stucco, and other masonry surfaces. By retarding moisture absorption, the preservative guards against seepage, discoloration, efflorescence, and hinders cracking from freezing. It can be applied to walls already painted with water paints.

454

Electric Chain Hoist

Manufacturer: The Yale & Towne Mfg. Co., Philadelphia, Pa.

Equipment: Chain-Type Load King electric hoist in capacities of 500, 1,000, and 1,500 lb.

Features claimed: Standard models lift

loads through any height up to 40 ft. The hoist's principal distinction is that a link chain, over an electrically driven sheave, supports the load. This permits extra long lifting lengths, since the wound-up chain does not wrap around a drum but collects in a metal container as the hook rises. The hoist hook can reach out as far as 30 deg. from the vertical when picking up loads. The wide pickup angle and the flexibility of the single strand load chain reduces time consumed in inching the hook up or down for close spotting.

455

Aluminum Alloy Scaffolds

Manufacturer: Up-Right Scaffolds, Berkeley, Calif.

Equipment: Lightweight scaffolds that can be erected in any size or shape.

Features claimed: The new "Tube-and-Coupler" scaffolds have less than half the weight of iron pipe equipment to handle and lift. Swivel base plates require no wedging. Aluminum alloy couplers on aluminum alloy tubes provide twice the gripping friction of steel on steel. Tubing has ⅓ greater strength than iron pipe tubing of similar diameter.

456

Admixture Meter

Manufacturer: Koehring Company, Milwaukee, Wis.

Equipment: Admix meter for 16-E and 34-E Twinbatch pavers.

Features claimed: The admix meter is designed as a metering device for measuring automatically a predetermined quantity of liquid air-entraining agent into the concrete batch. Entirely mechanical, movement of the paver skip actuates the meter. Capacity of the meter is adjustable, from 1½ to 20 fluid oz., in 1/10-oz. increments. A 40-gal. supply tank is included. The meter can be furnished with all new Twinbatch Pavers, or it can be installed in the field.

457

Mastic Spray Gun

Manufacturer: A. Shelburne Co., Los Angeles, Calif.

Equipment: Shelburne Model 105 hose, pump, and gun.

Features claimed: The gun features a larger diameter of nozzle head which permits delivery of a greater capacity of air-material flow for spray of heavy fibrated or granulated materials without the necessity of thinning. Material is sprayed in a quarter of the time previously required. The 105 has a fan spray pattern of 14 inches and larger, and can be changed from fan to round by a simple adjustment without different air caps.

458

Hydraulic Control for Scraper

Manufacturer: Kay-Brunner Steel Products, Inc., Los Angeles, Calif.

Equipment: Hydraulic control for Kay-Brunner 1½-cu. yd. carrying scraper.

Features claimed: By replacing the rope-actuated latch on the bowl with hydraulic operation, the Kay-Brunner scraper is now fully hydraulically controlled. The improvement permits the bowl to be held in a fixed position so that it can be used for land leveling as well as hauling, scraping, and spreading. The control is the single valve type, standard equipment on all wheel tractors, and can be operated off the same hydraulic unit now being used for other attachments. Bowl capacities are 1.25 cu. yd. struck and 1.50 cu. yd. heaped measure.

LITERATURE FROM MANUFACTURERS...

Copies of the bulletins and catalogs described in this column may be had by addressing a request to the Western Construction News, 609 Mission Street, San Francisco 5, California.

459

PLASTIC CEMENT — **Calaveras Cement Co.** has issued a new pamphlet describing the uses, qualities and specifications of its new plastic cement. The pamphlet contains detailed recommendations for the mixing and application of the cement, and describes the recently-introduced product as ideal for every interior and exterior stucco use, as well as the laying of bricks and concrete building units, etc.

460

TRANSIT MIXERS—**Chain Belt Co.**, Milwaukee, Wis., has published a bulletin illustrating and describing Rex Horizontal Moto-Mixers and new Rex Adjusta-Hite Discharge Moto-Mixers. The 16-page booklet gives detailed descriptions of the many features of the units. Cutaway views, job illustrations and dimensional drawings clearly show these features in operation. The advantages of Fluid-Drive Couplings with the Rex Chain Drum Drives and Rex Transmission are fully explained and illustrated. A complete table of specifications and mounting dimensions for all sizes of both units is given.

461

PORTABLE COMPRESSOR—**Davey Compressor Co.**, Cleveland, Ohio, has published a bulletin describing the firm's new

60-c.f.m. Super Chief portable compressor. The bulletin lists all features of the low-priced machine which the manufacturer claims is the lightest in weight, most economical operating compressor available today. The bulletin shows the compressor in use on various types of jobs. Complete specifications are listed.

462

SELF-POWERED PAVER—**Dotmar Industries, Inc.**, Kalamazoo, Mich., has released a bulletin describing the Dotmar paver for laying integral gutter, curb and sidewalks, or sidewalks alone, up to 78 in. wide. Many one-the-job pictures are shown, various types of available screeds and trowels are described and complete specifications are given.

463

HYDRAULIC ACTUATING CYLINDERS — A bulletin describing the use of hydraulic actuating cylinders for the removal of mold cores from fresh concrete during production has been published by **Ledeen Mfg. Co.**, Los Angeles. The difficult core removal, and the time-saving solution using Ledeen Heavy-Duty Cylinders is described, along with cylinder and pressure information. This application suggests the use of hydraulic or pneumatic cylinders for other straight line motion problems.

464

PORTABLE POWER TOOLS—**Independent Pneumatic Tool Co.**, Aurora, Ill., has published three new circulars covering Thor universal electric tools and contractors' tools. One circular gives complete data on the new Thor "Copper Line" tools. The release covers the new low priced Thor ¼ and ½-in. drills and also illustrates and describes the new drill stands available for these drills. Another circular describes the new Thor Model 35 Sinker Rock Drill, giving complete tool specifications supplemented by cutaway drawings of integral parts of the 35-lb. tool. The third circular catalogs four Thor mining tools, describing and illustrating a new sinker leg, air bar feed, pneumatic column and stopper leg.

465

TURRET TRUCKS—Five models of Hyster Salsbury Turret Trucks, formerly manufactured by the Salsbury Corp. of Los Angeles and now taken over by the **Hyster Co.**, Portland, Ore., are pictured and described in an 8-page bulletin published by Hyster. Included in the turret line for horizontal materials loading are Platform, Pallet and Cargo Trucks as well as Tugs

and Auto-Loaders. Powered by a Wisconsin air-cooled engine and traveling up to 8 mph. when fully loaded, each truck is equipped with the Salsbury fully automatic clutch and transmission. The trucks will handle any load up to a capacity of 4,000 lb., according to the catalog.

466

AIR TOOLS FOR CONSTRUCTION—**Schramm, Inc.,** West Chester, Pa., has published a booklet describing the firm's complete new line of 1950 Golden Anniversary Tools. Included in the group are: Rock drills, the latest WDR-126 wagon drill, paving breakers, clay spades, trench diggers, backfill and tie tampers and a complete line covering every construction tool requirement, including chain saws, vibrators, air hose and all necessary accessories. Specifications and recommendations are presented for each tool.

467

PROTECTIVE COATING FOR MASONRY — **Prufcoat Laboratories, Inc.,** Cambridge, Mass., has published a bulletin describing Pruftite, a coating made up of chemically inert alkali and water-proof resin particles which control water seepage and dampness, above and below grade, interior or exterior, on brick, concrete, cement plaster, stucco and concrete masonry units.

468

MOBILE LOADER — **J. D. Adams Mfg. Co.,** Indianapolis, Ind., has published a bulletin describing the new Adams TraveLoader of the self-propelled, self-feed, belt type. The unit is described as picking up and loading any kind of windrowed material (such as dirt, sod, gravel, sand, bituminous mix, scarified black top, snow, etc.) faster and at less cost than any other machine or method. The bulletin describes how the TraveLoader operates by means of illustrations and text. Feature of the unit that is completely discussed is the full-floating feeder that automatically adjusts itself to the size of the windrow. Complete specifications are included.

469

HIGH-SPEED DIESEL ENGINES—Sixty-eight high-speed Diesels for automotive, industrial and marine applications, covering the entire power range from 50 to 550 hp., and three medium-speed Diesels, are described in a 36-page condensed catalog issued by **Cummins Engine Co.,** Columbus, Ind. Comparative charts, listing the major specifications for each engine, are included in the catalog to assist in the preliminary selection of a Cummins Diesel for any specific application. The catalog lists for the first time 27 new Cummins models introduced within the last year.

470

PHYSICS OF THERMAL INSULATION—**Infra Insulation, Inc.,** New York City, has published a 44-page booklet entitled "Simplified Physics of Thermal Insulation." The booklet covers the subjects of heat transfer, condensation, vapor, vermin, mold, fire and radiant heating. Materials are thoroughly investigated, and problems of installation are completely discussed.

471

DOUGLAS FIR PLYWOOD—A 20-page booklet completely describing the types and uses of Douglas fir plywood has been published by the **Douglas Fir Plywood Association,** Tacoma, Wash. The booklet is intended to give basic information about fir plywood to both specifiers and users of panels. Completely discussed are the product, its advantages, building codes that affect plywood construction and all the physical properties of the different types of fir plywood. Also available to engineers and architects on request is the looseleaf handbook, "Technical Data on Plywood," which treats such subjects as design with plywood, working stresses, preventing condensation, deflection, insulation values, strength of nailed joints, design of plywood beams, etc.

472

LEAD ACID BATTERY PROBLEMS—**Pioneers, Inc.,** Oakland, Calif., has printed a revised pamphlet containing condensed information on what you should know about lead-acid batteries in order to maintain them. The pamphlet also contains information on how the harmful effects of sulfation, which is the direct or indirect cause of most battery failure, can be reduced with "Battery AD-X2," thus extending the life expectancy of lead-acid batteries.

473

TRENCHER — **Parsons Co.,** Newton, Iowa, has published a new catalog describing the latest improvements and capacities of the Parsons Model 250 Trenchliner. Printed in attractive colors, the 8-page bulletin contains photographs depicting many exclusive Trenchliner features along with schematic drawings listing the detailed dimensions of the machine. Heavy-duty built and economical in operation, the Model 250 is described as particularly well suited to handle trenching assignments of work projects of cities and utilities, and also

to save valuable time on highway, airport, and railroad drainage work.

474

WELDING STAINLESS STEEL—A brochure on some interesting aspects of arc-welding stainless steel with new Eutectic Staintrodes, illustrated with verified case histories, is available from **Eutectic Welding Alloys Corp.**, New York City. Featured in the case histories is Eutectic's full line of Staintrodes, described as the most advanced type of stainless steel electrode for low heat welding. Most informative of the case histories described in this folder is that of the construction of a piping system for an Atomic Energy Power Plant.

475

5½-YD. SHOVEL-CRANE—**Manitowoc Engineering Works,** Manitowoc, Wis., has published a 16-page bulletin giving a full explanation of features plus detailed specifications on the firm's new Model 4500 5½-cu. yd. shovel, crane and dragline. Described as especially designed for mobility, this machine has air controls for all operating clutches and brakes, straight Diesel power and crawler drive which make it adaptable for any locality or terrain.

476

ALUMINUM COPINGS AND GRAVEL STOPS—**Aluminum Company of America,** Pittsburgh, Pa., has published an 18-page booklet bringing up to date all information on aluminum copings and gravel stops. Types of copings for any wall thickness are described, and typical installations are shown by pictures. Perspective drawings show installation details. Master specifications are included in the booklet.

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

CLASSIFIED SECTION

Rates are $6.50 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 1st if no proofs are required.

STATE RIVERS AND WATER SUPPLY COMMISSION VICTORIA, AUSTRALIA

BIG EILDON PROJECT

TENDERS are invited from organizations experienced in the construction of large civil engineering works for the construction of the **BIG EILDON DAM** at Eildon in the State of Victoria, Australia.

The construction of the dam will involve the excavation and placing of approximately 13,000,000 cubic yards of earth and rock-fill in embankment with a maximum height of about 260 feet, approximately 300,000 cubic yards of concrete work, outlet and control works and appurtenant structures, including a **PONDAGE WEIR** about three miles below the dam.

Contracting organizations are invited to submit **TENDERS** for:—

(a) A Schedule of Rate Contract;
or
(b) A Cost-Plus Contract based on a "Target Estimate" to be submitted by the tenderer.

EXHIBITION DOCUMENTS comprising **GENERAL CONDITIONS OF CONTRACT, PLANS AND SPECIFICATIONS AND CONDITIONS OF TENDERING** together with engineering and geological reports, and general information concerning prevailing wages, rates and employment conditions are available at £10.10.0 per set and will be forwarded to bona fide prospective tenderers on receipt of written applications, enclosing cheque, addressed to—

The Secretary,
State Rivers and Water Supply Commission,
100-110 Exhibition Street,
MELBOURNE, C.1.,
VICTORIA, AUSTRALIA.
or
The Agent-General for Victoria,
Melbourne Place,
Strand,
LONDON.

TENDERS endorsed "Tender for Construction of Big Eildon" will be received by the Secretary, State Rivers and Water Supply Commission at 100 Exhibition Street, Melbourne, until 12 noon on 30th June 1950. A preliminary deposit of £A1,000, payable at Melbourne, must be lodged with the tender and will subsequently be refunded to unsuccessful tenderers.

Lowest of any tender not necessarily accepted.

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ADVERTISERS AND ADVERTISING AGENCIES CHANGE YOUR RECORDS

Effective with the July Issue, *Western Construction News* will be published on the 1st of each month. Display advertising forms close on the 5th of preceding month, instead of the 10th.

NOTE:

All advertising plates and copy for the July Issue must be in San Francisco by June 5.

Thank you,
Advertising Department