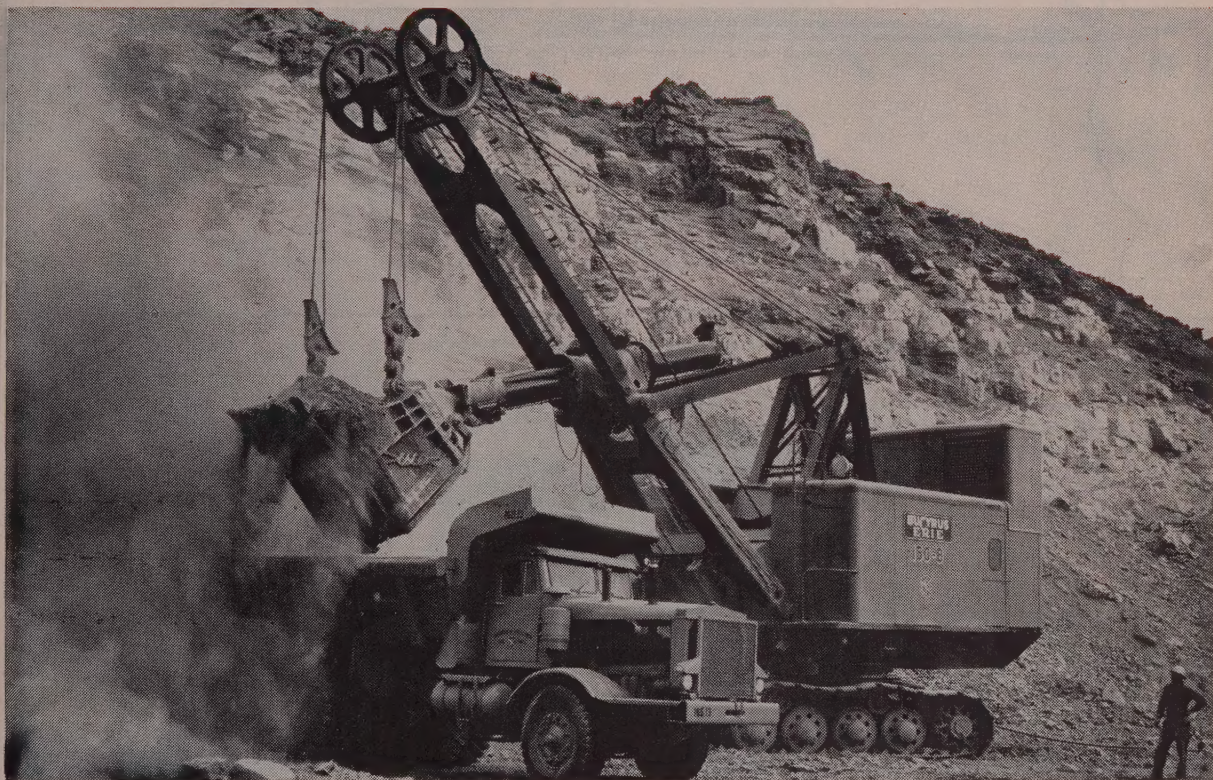


DECEMBER



Rock moving starts on Salt Lake fill

Fleet of new equipment worth \$15,000,000 begins work on 12.7-mi. rockfill roadbed for Southern Pacific Co. Record-breaking features include 250-ft. long bottom-dump barges and 2-mi. long conveyor belt. Morrison-Knudsen is prime contractor on \$49,000,000 job.

"IT REMINDS ME of the way things were when Grand Coulee Dam was getting started." That's how one veteran superintendent summed up his impression of the activity taking place on the construction of Southern Pacific's rock and gravel road-bed across Great Salt Lake. There is the same sense of vastness, the same elaborate preparations, and the same feeling that a historic construction project is getting under way.

The \$49,000,000 fill will require four

years to build and will replace an existing 12-mi. long trestle and connect 18 mi. of existing shallow water fills. The trestle, called the Lucin Cutoff, is the world's longest and was something of an engineering marvel when it was built in 1904. Over 30,000 pilings were used in its construction. The need for permanent indestructible passage over the lake motivated Southern Pacific to investigate other types of crossings.

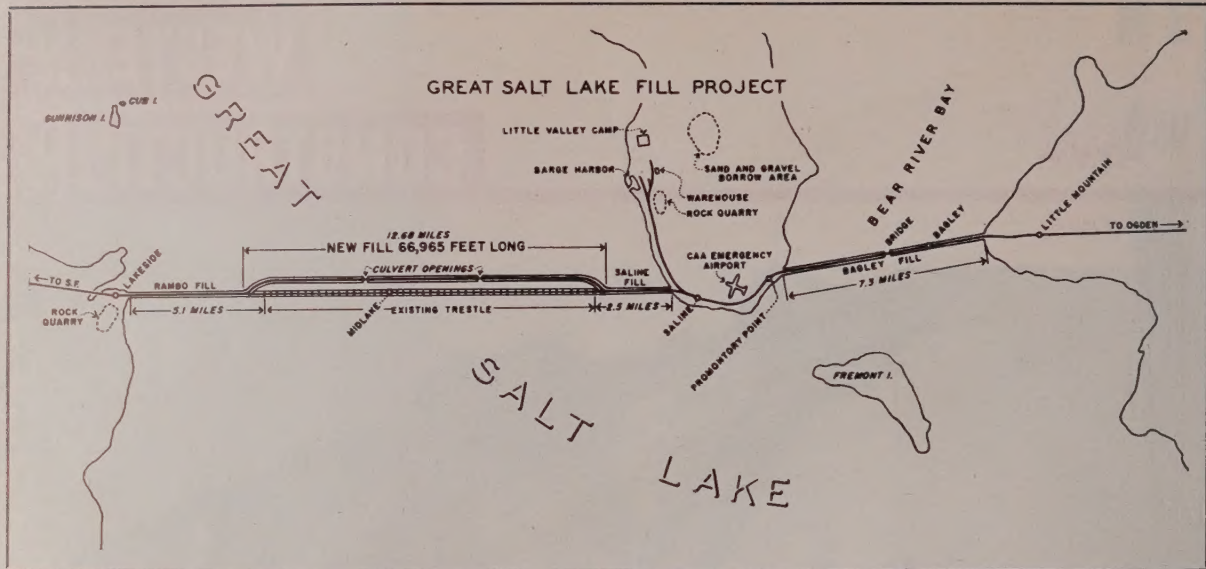
The problem was turned over to

International Engineering Co., Inc., of San Francisco. After extensive soils investigations it was decided that a rock and gravel fill was the most economical solution. In March of 1956 Southern Pacific signed a contract for construction of the fill with Morrison-Knudsen for about \$45,000,000. The new route will be parallel to and 1,500 ft. north of the existing trestle.

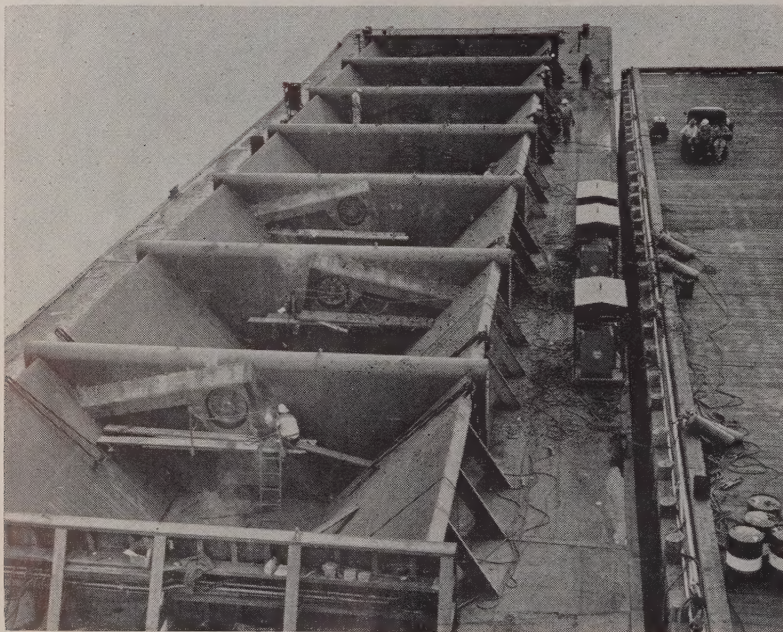
The job involves removing 15,000,000 cu. yd. of silt along the centerline of the fill by hydraulic dredging. The fill will require 19,000,000 yd. of gravel, 12,000,000 yd. of quarry-run rock, and 1,100,000 yd. of select rip-rap.

Equipment price tag: \$15,000,000

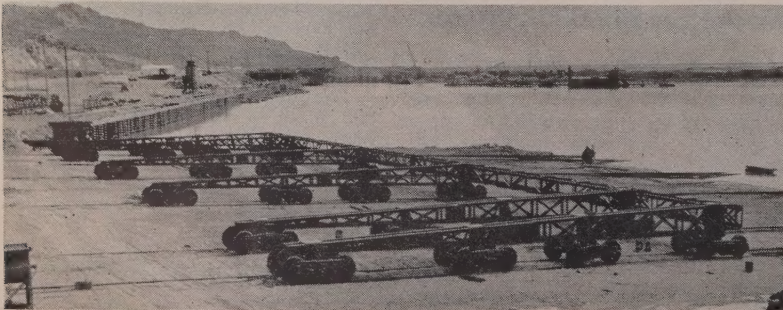
To handle this tremendous quantity of material \$15,000,000 worth of new equipment has been assembled,



THE PROJECT is located due west of Ogden. The fill will have culvert openings for passage of water and small boats. Close-up of harbor appears at top of next page.



ONE OF SIX bottom-dump barges, 250 ft. long and 55 ft. wide, receives shields to protect pulley and cables which control drop-gates. Barges are biggest of type ever built.



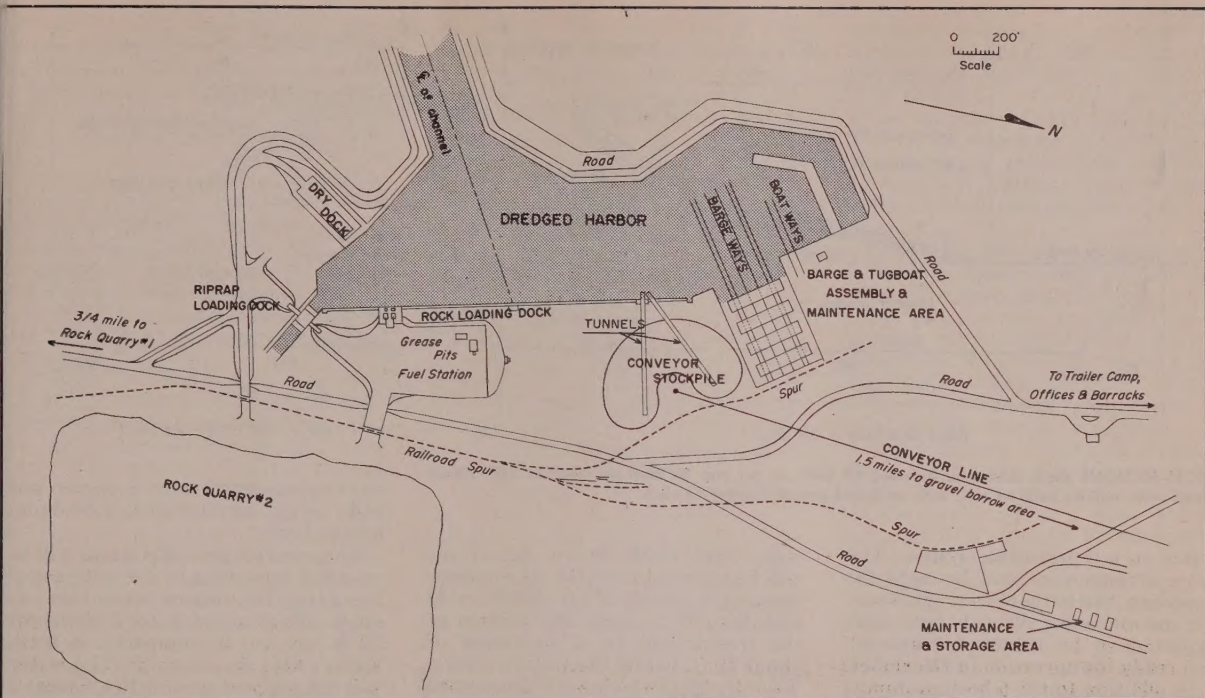
BARGE LAUNCHING CARRIAGE is mounted on six railroad tracks sloping into the harbor. Carriage will also be used to remove barges from water for maintenance.

all of it owned by Southern Pacific. Included are six of the biggest barges ever built, 250 ft. long and 55 ft. wide; a 2-mi. long conveyor belt capable of moving 4,200 tons of material an hour; six Bucyrus-Erie model 150B electric shovels with 7 and 8-yd. dipper; 11 25-cu. yd. Euclid bottom-dump trucks; and 15 Euclid 17-yd. end-dump trucks. A complete list of the major pieces of equipment accompanies this article.

The construction area is located about 25 mi. west of Ogden on the west side of Promontory Point, a peninsula which extends into the lake. Almost all men and materials are brought to the site by a spur railroad line built by the railroad which connects with Southern Pacific's main line at Saline. So far about 1,500 railroad cars have been unloaded.

One of the first tasks undertaken by M-K was the construction of the camp. The camp is called Little Valley and has facilities for 300 trailers—there are about 250 on the site now. A total of 25 Butler buildings were constructed, including 5 barracks with 56 men in each, a mess hall seating 200, a recreation hall, a store, and a school from the first to the tenth grade with a present enrollment of 186 students. Little Valley is expected to reach a population of 2,000, but when the job is finished it will take its place among many other Western ghost towns.

Work carried out by subcontractor includes: the 44-kv. power line brought in from Ogden by Trowbridge & Flynn; the docking and barge loading facilities by Ben C. Gerwick of San Francisco; barges fabricated by Kaiser Steel Co. and assembled at the site by Chicago Bridge & Iron Co., and the tug boats, built and assembled by Gunderson Bros. Engineering Corp. The 200,000-sq. yd. harbor required the removal



by hydraulic dredging of about 1,000,000 cu. yd. of material. Although the shore of the lake is only several hundred yards away, the lake is so shallow (maximum depth 35 ft.) that a channel from the harbor to water over 15 ft. deep had to be 14,700 ft. long. The big barges need about 13 ft. of water for safe operation.

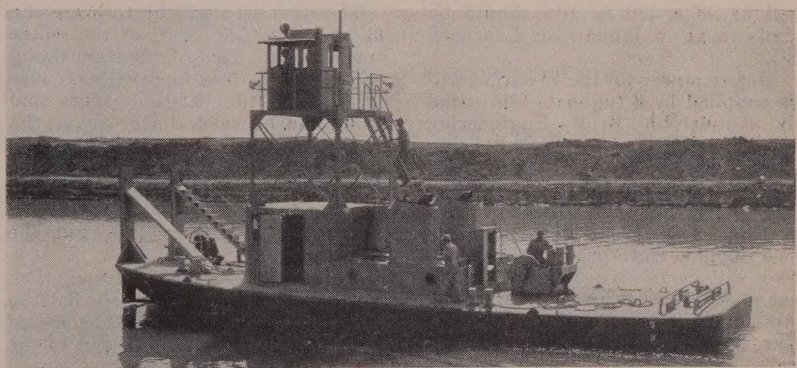
The dock is 1,600 ft. long and has facilities for barge loading at three locations. At one point gravel will be placed in the barges by the conveyor belt. Quarry-run rock will be placed into the barges partially by skips and partially from end-dump trucks. Riprap, ranging in size from one to three tons, will be brought to the dock by end-dump Euclids which will empty into a skip. The skip will be used to transfer the boulders from the trucks to the barges to prevent damage to the barges.

The Salt Lake Navy

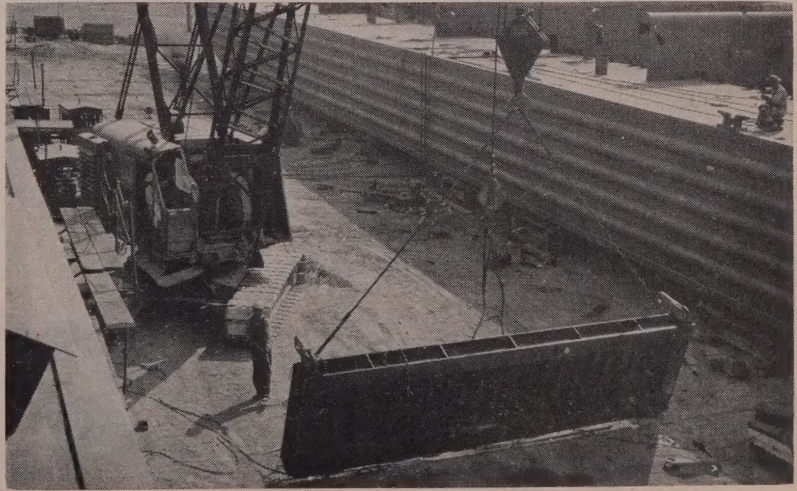
The six bottom-dump barges are probably the largest of this type ever built. Each is 250 x 55 ft. and is capable of carrying 2,000 cu. yd. of material. Loaded weight is over 4,000 tons. The barges are divided into seven hoppers, each of which has a pair of drop gates. The gates are controlled by two cables 2 1/4 in. in diameter.

Each barge was assembled from 32 steel sections ranging in weight from 10 to 30 tons and brought to the site by Southern Pacific from Kaiser Steel in California. The barges were launched on a carriage mounted on 96 railroad wheels and running on 6 parallel tracks sloping into the harbor. The barges were launched by slowly lowering the carriage into the

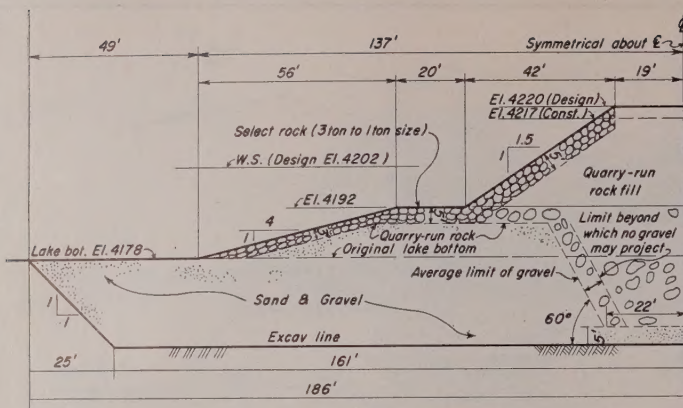
HARBOR AREA is center of activity, is dredged to a depth of 15 ft. Channel to lake is 14,700 ft. long. Trailer city, barracks, and offices are short distance away to right.



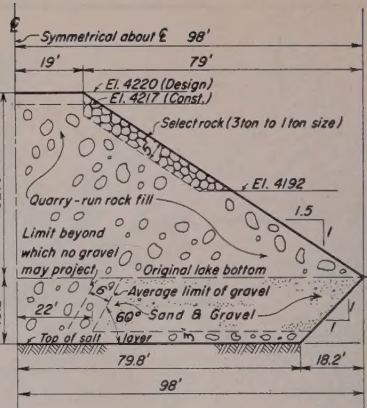
FIRST OF EIGHT tugboats was launched in September. Cabin is elevated to enable captain to see over the huge barges. Six of the tugs pack two 500-hp. Enterprise engines.



DROP-GATE is lifted for positioning in one of the barge's seven hoppers. Gates are controlled during opening and closing by cables 2 1/2 in. in diameter. Barges carry 2,000 cu. yd.



HALF SECTION — ON SILT



HALF SECTION — ON SALT

CROSS-SECTIONS show difference between fill built on silt and fill built on layer of salt. About seven miles will be built on salt, with no broad gravel blanket needed.

water on a 6-part cable system. The same arrangement will be used for removing the barges from the water for maintenance. All 6 barges were expected to be launched, outfitted, and ready for operation in December.

In addition to the 6 bottom-dumps there are 7 flat-top barges now being assembled in sections in Provo by Hammond Iron Works. The flat-tops will be 48 x 170 ft. and should be ready to go in January or February 1957.

Motive power for the 13 barges will be supplied by 8 tugboats fabricated by Gunderson Bros. Engineering Corp. in Portland, Ore., and being assembled by them at the site. The tugs were divided longitudinally and brought to the job by railroad in two sections. Six of the tugs will carry two 500-hp. Enterprise engines and two will carry two 300-hp. engines each. A picture of the first tug launched last September appears with this article. The pilot's cabin is elevated in order that he may see over the huge barges.

The construction plan

The first phase of the construction sequence, dredging, is now under

way. Over 15,000,000 cu. yd. of silt will be removed from the lake bottom creating a trench 175 to 480 ft. wide and 20 to 35 ft. deep. The bottom of the trench will be a maximum of about 70 ft. below the water surface. Two dredges, which were dismantled and shipped by rail, one from California, the other from Alaska, are handling this work.

The next step will be to bring the fill up to within 10 ft. of the water surface by use of bottom-dump barges. Next, drag-lines will take material from the flat-top barges and bring the fill several feet above the water surface. The final 15 ft. will be placed by end-dump Euclids. In a few months these four operations will be taking place concurrently, each several hundred yards behind the other.

This plan—first dredges, then bottom-dump barges, then flat-top barges, finally trucks—will be varied substantially only at each end of the fill, where it joins the existing trestle. Since rail traffic must be maintained on the trestle no dredging is permitted within 300 or 400 ft. of it. So, a broad transition fill must be placed directly on the silty bottom. Crews of Southern Pacific and the contractor

have completed this work on the east end using air-operated side-dump railroad cars.

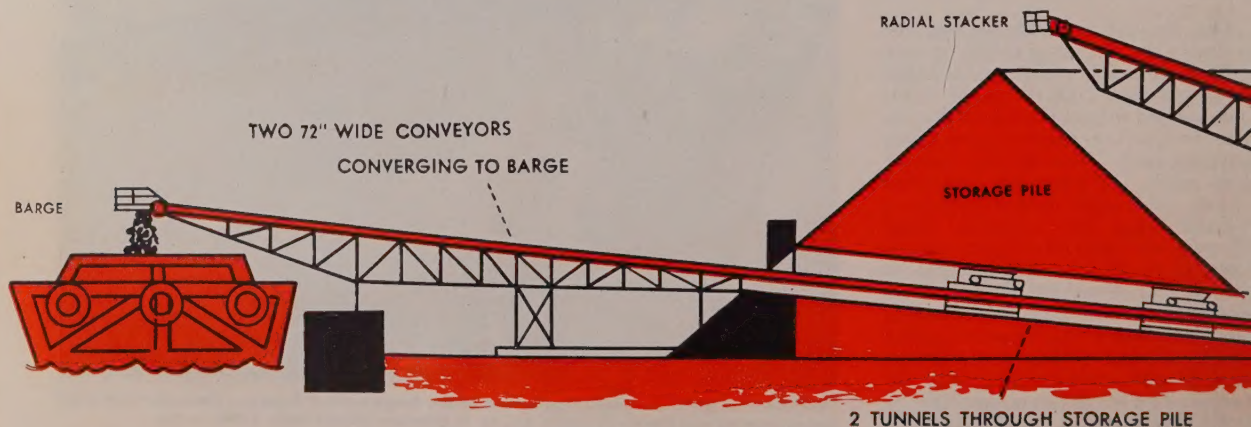
The construction operations will be modified somewhat by the saltiness of the water. It contains seven times as much salt as ocean water and weighs 76 lb. per cu. ft. compared to fresh water's 62½ lb. per cu. ft. The water will not support marine life, except a small shrimp, so the contractor need not worry about making provisions for fish or fishermen.

The density of the water gives the floating equipment more buoyancy. The bottom-dumps when fully loaded draw only 11 ft. This was an important factor to be considered when dredging the harbor.

Because of the high conductivity of salt water the damage to steel hulls from electrolytic action would be excessive and for this reason all floating equipment is being provided with cathodic protection.

Probably the biggest disadvantage as far as the men are concerned is the fact that on a windy day everything gets covered by a film of salt. It is expected that the equipment will have to be scraped periodically.

The start of rock production at quarry No. 2 was signaled in September with a large coyote hole blast. About 190,000 lb. of powder were touched off to loosen about 160,000



2 TUNNELS THROUGH STORAGE PILE

cu. yd. of rock. Powder was supplied by Atlas Powder Company. At quarry No. 1, about a mile from the loading docks, 2 Bucyrus-Erie 150B electric shovels are at work cleaning the overburden away from the rock face.

Riprap will consist of boulders weighing from 1 to 3 tons. All gravel will be less than 8 in. in diameter. No material containing more than 20% by weight of particles passing a 200-mesh screen will be used in the fill.

Twenty-four surveying platforms are being built to control dredging and barge dumping.

Sudden storms which come up over Great Salt Lake are a source of concern. In winter, winds of 60 mi. per hr. and temperatures around zero are not uncommon. Storms can be troublesome. Waves can get as high as 8 ft. and are particularly hard on equipment because of the weight of the water. In the hopes of getting sufficient warning in advance of a coming storm, Intermountain Weather, Inc., meteorological consultants, have been retained. They have set up weather stations at Little Valley on Promontory Point, half way across the lake on the existing crestle, and at Lakeside on the west

side of the lake and on the two dredges. Readings are taken periodically from these stations and the weather is forecasted twice a day, or more often if a storm is developing.

The 12.7-mi. long fill will require 19,000,000 cu. yd. of gravel, which is being carried from the borrow area 8,000 ft. to a stockpile at the dock by an unusual conveyor system. In the borrow area a gravel unloading bridge has been constructed. Bottom-dump Euclid trucks drive onto the bridge and unload into a 50-cu. yd. hopper. The material is then fed into a heavy-duty scalping screen and rocks over 8 in. are run through a 36 x 42 Pioneer crusher. When the material reaches the conveyor belt large boulders have been reduced in size to a maximum of 8 in.

The bottom-dump Euclids are being loaded by Bucyrus-Erie electric shovels. As the shovels advance the haul to the gravel unloading bridge will become longer and longer until finally it will be economical to build another bridge nearer the shovels and extend the conveyor to it. It is expected that the bridge will be re-located three or four times in the course of the 4-yr. project.

The conveyor system was designed

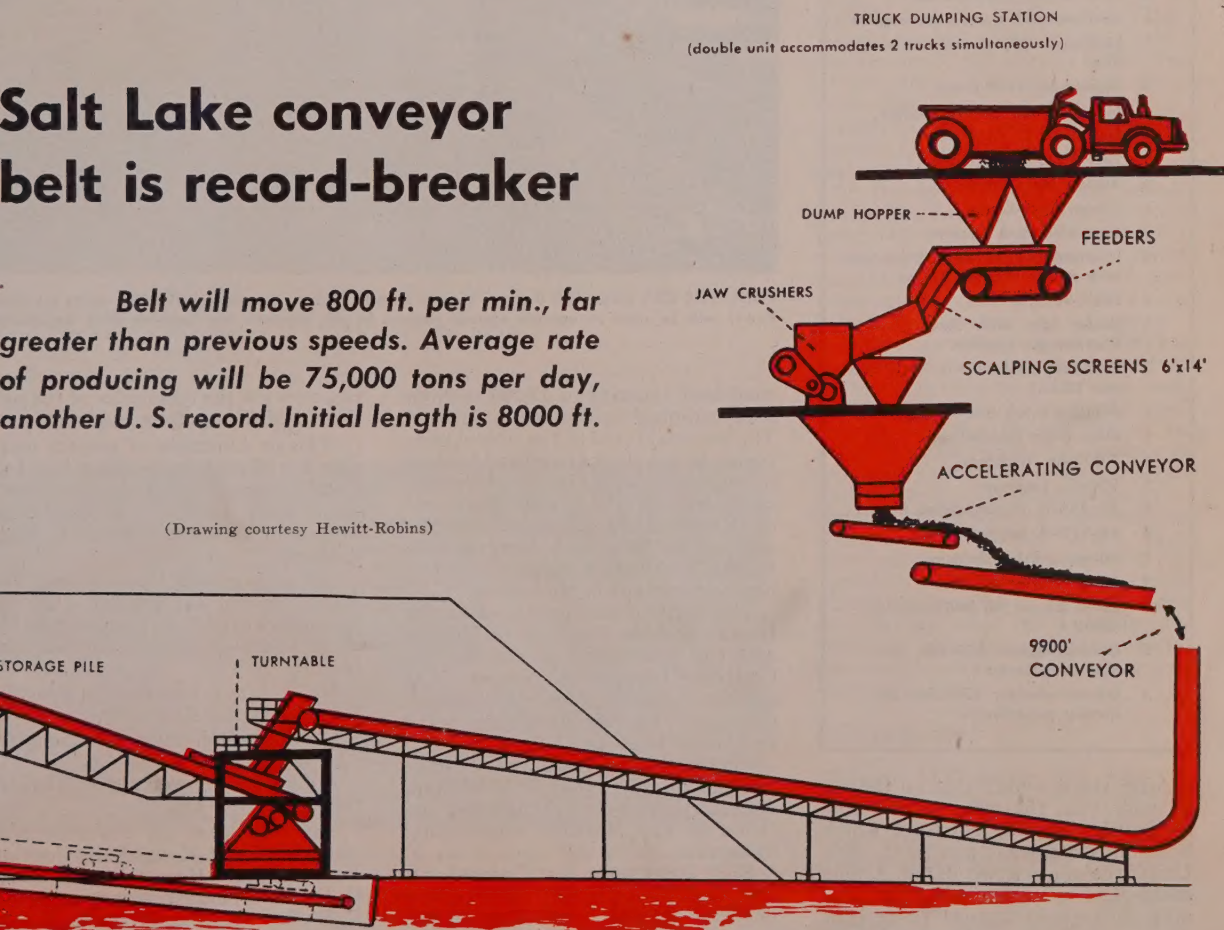
and manufactured by Hewitt-Robins, Inc., and will handle the gravel at an average rate of 75,000 tons a day, a U. S. record for overland conveyors. When operating at full capacity, the rate can be increased to 90,000 tons, working three shifts. The speed of the belts will be 800 ft. a min., exceeding usual belt speeds by 300 to 400 ft. a min.

Even more unusual than high speed is the fact that the main part of the conveyor system requires little or no power from outside sources. This is because the conveyor coasts down-grade from the gravel hill to the lake. The three motors attached to the three main conveyor units function as a braking system to regulate the speed of descent. A drive mechanism starts the conveyor and controls its speed. The mechanism utilizes special clutches attached to a drive pulley and a holdback pulley. When power is required to drive the conveyor the drive pulley is automatically engaged and the holdback pulley remains free-wheeling. When the conveyor reaches full speed the holdback pulley takes over from the drive pulley and regulates the conveyor's descent. The energy created is converted into electrical power by the motors which in

Salt Lake conveyor belt is record-breaker

Belt will move 800 ft. per min., far greater than previous speeds. Average rate of producing will be 75,000 tons per day, another U. S. record. Initial length is 8000 ft.

(Drawing courtesy Hewitt-Robins)



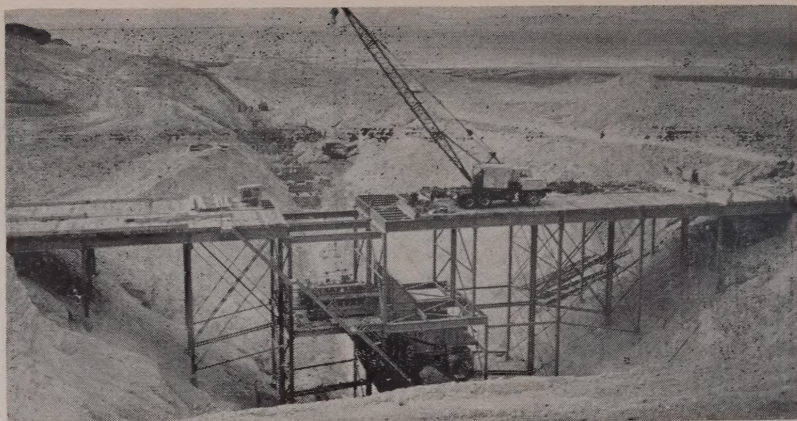
effect will become electrical generators. The wiring system is arranged to direct the generated power back to the main transmission line. The amount of surplus electricity generated by the three regenerative motors is about 600 kw., enough to meet the power requirements of about 4,000 average size homes. The drop in altitude from the gravel hill to the lake is 400 ft.

Equipment List

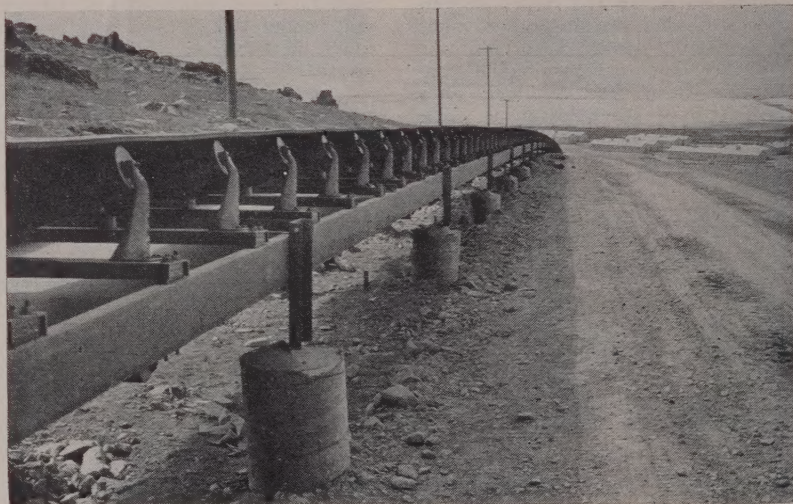
(All new—all owned by Southern Pacific)

- 21 Chevrolet 1/2-ton pickups
- 9 Chevrolet sedans and panels
- 3 Chevrolet 3/4-ton pickups
- 2 Chevrolet 8-yd. tandem dumps
- 6 Chevrolet 1 1/2-ton trucks
- 5 Chevrolet 2-ton trucks
- 2 White 10-ton trucks with 35-ft. flat trailers
- 2 2 1/2-ton, 6-yd. transit-mix trucks
- 1 Euclid 5,500-gal. water truck
- 15 Euclid 17-yd. end-dump trucks
- 1 Bucyrus-Erie 718 shovel and dragline
- 1 Bucyrus-Erie 88B shovel and dragline
- 6 Bucyrus-Erie 150B shovels
- 1 Northwest 95 crane and dragline
- 2 Northwest 80D shovel and dragline
- 1 Manitowoc 3500 crane
- 1 Northwest 25 shovel-dragline
- 1 Northwest 25 truck crane
- 1 P&H 30-ton truck crane
- 2 30-ton Moto-Cranes
- 1 15-ton Moto-Crane
- 12 Caterpillar D-8 tractors
- 2 International Harvester T9 tractors with Austin-Western booms
- 4 LCVP landing craft
- 1 Water taxi with two 200-hp. Chrysler gas engines
- 2 Hydraulic dredges (one 15-in. and one 18-in.)
- 1 Mancha 6-ton locomotive
- 2 Atlas 6-ton locomotives
- 6 1,000-hp. tugboats
- 2 600-hp. tugboats
- 6 55x250-ft. bottom-dump barges
- 7 48x170-ft. flat-top barges
- 2 50-ton stiff-leg derricks
- 1 12-ton stiffleg derrick
- 11 Euclid 25-cu. yd. bottom-dump trucks
- 5 Gardner-Denver 600-cfm. portable compressors
- 3 Gardner-Denver 550-cfm. stationary compressors.

After the downhill ride on the 54-in. wide belt, the material is transferred to a stacking conveyor which is building a storage pile 80 ft. high. Under the pile are two 180-in. Armco multi-plate tunnels, a conveyor running through each one. These conveyors are 72 in. wide and have a



GRAVEL UNLOADING BRIDGE nears completion as conveyor belt approaches from background. Bottom-dump trucks will unload into crusher which will feed material to conveyor in sizes smaller than 8 in. Bridge will be moved when truck hauls become too long.



CONVEYOR BELT drops 400 ft. from borrow area to harbor, generating 618,000 watts an hour. Power will be used to operate electric shovels in pit. Supports are concrete-filled Sonotubes.

combined capacity of 12,000 tons an hour running at 550 ft. a minute. The material is fed to the tunnel conveyors by a series of overhead feeders to control the rate of flow to any tonnage desired. These conveyors will carry the material about 250 ft. to the edge of the lake and dump it into barges. The barges were expected to begin operations in November.

The belting was produced at the Hewitt Rubber Division in Buffalo and the machinery at the Robins Conveyor Division in Passaic, N. J., and the Jones Machinery Division in Chicago. The cost of the conveyor equipment is about \$1,700,000.

Representing Southern Pacific Company on the job is H. J. Willard, construction division engineer, assisted by Lee Marsden, engineering inspector.

For International Engineering Co., Harold Anderson was resident engineer on the preliminary work, and Norman Rand will be resident

engineer for the remainder of the job. Oirind Moe is project engineer.

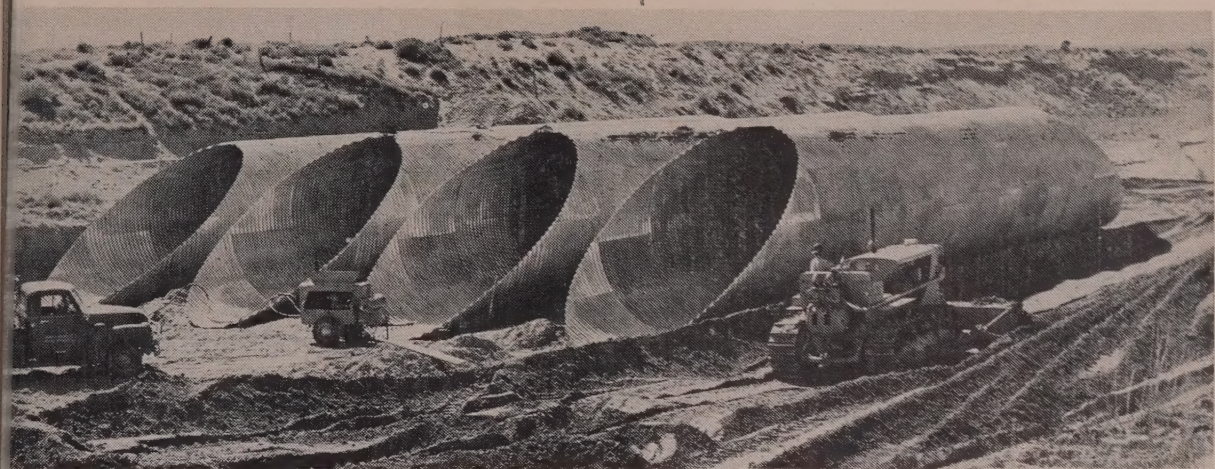
O'Dean Anderson is project manager for Morrison-Knudsen Co., Inc. Carl Larson is general superintendent, Denny Bagley is project engineer and R. K. Woodhead is office manager.

Consulting with International Engineering Co. on problems of soil mechanics are Dr. A. Casagrande, Dr. F. H. Kellogg, R. R. Philippe and Stanley Wilson.

M. D. Joplin was project manager for Kaiser Steel Fabrication Division. Orin Smith is superintendent for Chicago Bridge & Iron Co.

Robert Harvey was superintendent for Ben C. Gerwick.

Superintendent on conveyor construction for M-K was P. A. Corkins. Representing Hewitt-Robins were C. L. Tudor, managing engineer, and C. McLean, field superintendent. Personnel pictures appear on page 86.



Western highway evolution in New Mexico — From fords, to dips, to culverts

DRAINAGE ALWAYS WAS, and will always remain a basic problem of highway design and construction. Highway engineers recognize that a drainage crossing, regardless of whether culvert or bridge, should carry the heaviest flood of occasional occurrence without submergence of the entrance and handle the maximum rate of runoff without excessive damage to property or significant interruption of traffic.

Unfortunately, economics often entered the picture in the earlier days of roadbuilding, and engineers were forced to sacrifice what they considered necessary design standards in favor of various stop-gap measures. Standards for drainage facilities were one of the first to be lowered in order to stretch an inadequate highway construction dollar to its maximum limits.

In Western states, where drain-

By **TIMOTHY A. HARRISON**
Construction Specialist
Armco Drainage & Metal Products, Inc.

age problems are intensified by thousands of draws and coulees along roads, engineers hit upon a way of providing satisfactory highway cross drainage at extremely low costs. They gave proper consideration to the particular class of the highway they were designing, and roads with low-traffic volumes were designed with so-called "drainage dips." These were merely shallow vertical curves that crossed drainage ways nearly at grade and allowed water to run over the pavement during times of peak runoff.

Paved fords

These dips were essentially a new application of an old idea—they were actually paved fords. A majority of

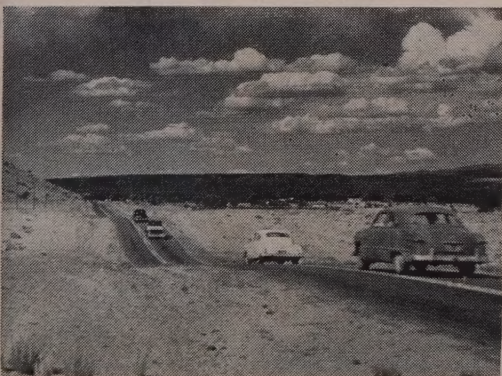
the time, especially in the Southwest, these streams are dry. But during periods of heavy rain, with high rates of runoff, the light traffic on these roads either forded the stream or waited until the flow had subsided. Except for the surfacing in the dip, this was much the same as in the days of the stagecoach and wagon train in the development of the West.

Highway dips were constructed to provide an apron of sod or riprap on the upstream shoulder of the road with the pavement at about stream grade. The downstream shoulder was protected with a concrete or timber retaining wall to hold the road against flood flow. In some cases, even concrete spillways were provided where high velocities were encountered.

Contrary to the common belief that highway drainage dips are found only in the West, they have also been used, with slight modification, in the eastern part of the United States. In many locations, again for reasons of economy, light-traffic roads were constructed with cross drainage incorporating a depression in the road and what were commonly called "low-flow" culverts. These dips were designed to handle the normal stream flow through culverts and allow flood flow to pass over the road. In the West, the culverts were not necessary because the draws and coulees had no normal flow.

Dollars dictated

Highway drainage dips were an expedient answer to the problem of making maximum use of the highway construction dollar on roads where traffic was relatively light. But today, these same roads are carrying many times the traffic they were originally designed to handle, and this traffic is



TRAFFIC goes through a typical dip on State Route 5 near Espanola, New Mexico. The familiar warning sign (right) of the Southwest is symbolic of highway design when dollars dictated "paved fords." Modern speeds and ever increasing traffic volume are factors which are forcing the demise of the dip. At the top of the page is an excellent example of a replacement, consisting of six 180-in. pipes on State Route 448.

traveling at far greater speeds. Even during dry periods, highway dips are now traffic hazards; and when filled with water, they cause significant delays to traffic or, in some cases, serious accidents.

Consequently, highway departments all through the Western states are replacing dips as fast as funds permit, to conform to modern highway standards. Replacements, today, usually involve the installation of pipe or pipe-arch culverts rather than the construction of a bridge. This fact is due to several reasons: (1) With modern earth-moving equipment, placement of a culvert and embankment is generally more economical than bridge construction; (2) structural-plate corrugated metal pipe and pipe-arch make possible culverts up to 15 ft. in diameter and larger for big waterway openings; (3) wide channels of draws and washes allow the use of multiple openings where capacity requirements exceed those available through single openings; (4) there are no load limits with the use of culverts and embankments; and (5) culverts can be installed with a minimum delay to traffic.

Replacement of dips, of course, involves considerably more engineering than was required for their original construction. As with the case of the design of any permanent drainage structure, drainage areas and runoff characteristics must be carefully investigated, required capacity and grades determined, highway loadings and erosive forces taken into account, and the culvert installation and embankment construction properly supervised.

NEW MEXICO

New Mexico probably constructed as many, if not more, highway dips for drainage purposes as any state in the West during the early days of roadbuilding. A number of these dips are still in use where light traffic does not yet justify their replacement. But most of the dips in the state have been replaced or are scheduled for replacement in the near future. Those that have been replaced were, for the most part, in areas where large quantities of water passed over the highway during times of heavy runoff.

For example, here's how New Mexico highway engineers planned and carried out one dip replacement. New Mexico State Route 448 (known locally as North Coors Road) west of Albuquerque was originally a county road that provided people living along the west bank of the Rio Grande with access to Albuquerque and Alameda. As population and traffic increased, the road became important as a cut-off around Albuquerque between U. S. Route 66 and State Route 45 to Santa Fe. The state decided to realign part of it and provide an adequate paved surface.

The road had originally been constructed with a number of dips. In the plans for the new improvement, most of these were replaced with Armco corrugated metal pipe. One replacement is of special interest because of the large drainage area involved. At this particular location, state highway engineers had recognized for some time that they had a serious problem. After every rain of any consequence, water would be over the road, sometimes several feet deep. The downstream side of the road was periodically subjected to severe erosive damage.

Area of drainage

In preparing plans for the replacement of this dip, engineers carefully surveyed the drainage area. They found this area involved about 85 sq. mi. of relatively flat land. From precipitation and runoff observations, they computed the size of the necessary drainage opening under the highway to be approximately 1,060 sq. ft.—no small opening to be handled with culverts. However, the channel width was such that six 180-in. diameter structural-plate pipes could be used to provide the necessary capacity. These were subsequently specified and installed. (See

IN THE SOUTHWEST where small drainage channels are either dry or filled with the occasional flash flood, the multi-unit culvert is an obvious solution to the problem. The two outside pictures show installations eliminating dips on New Mexico highways. The middle picture shows four Armco Pipe-Arches solving a problem of limited headroom.

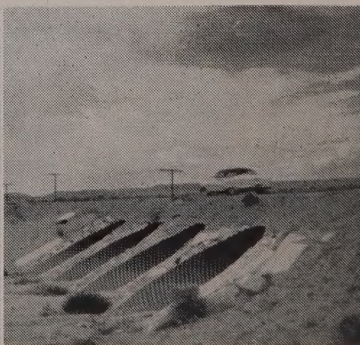
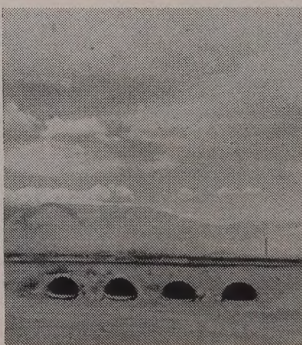
large pictures on first page of article.)

The six Armco pipes which replaced this highway dip were designed with 7-gage invert plates where erosion was most likely to occur. The remainder of the plates were 8 gage. Pipes were spaced 90 in. apart from edge to edge to facilitate backfill operations. Ends of the pipes were beveled 1½:1 to fit the embankment slopes which were completed with concrete blanket to prevent erosion. Total cover over the six pipes, each 84 ft. long, was 9 ft. Foundation was no particular problem; the stream bottom was a gravelly sand, ideal material for bedding the pipes. Likewise this gravelly material was used for the backfill with excellent results after tamping. There was no measurable deflection in the pipes after placement of the embankment and pavement.

In other locations throughout the state, corrugated metal pipe and pipe-arch culverts have been used in literally all sizes and shapes for dip replacement. For example, four dips south of Valmont on U. S. Route 5 were replaced with two 43-in. spans by 27-in. rise pipe-arches at each dip. Two dips west and south of Broadview on State Route 18 were replaced with nine corrugated metal pipe-arches of the same size at each dip. In still another location, four 96-in. structural-plate pipes were used to replace a dip on U. S. Route 64 north of Riverside.

Design of corrugated metal pipe and pipe-arch culverts to replace dips in New Mexico is under the general supervision of L. D. Wilson, chief engineer of the New Mexico Highway Department. Design work is under the direct supervision of W. E. Strohm, bridge engineer for the Department. Contractor on the realignment of State Route 448 was Miller Smith & O'Hara, Inc., of Albuquerque.

New Mexico and other Western states have used and are using pipe culverts extensively for replacement of dips with good results. Providing there is adequate attention paid to determining the capacity requirements and careful supervision of the installation, pipe culverts are an efficient and economical means of replacing highway drainage dips.



THE GREATEST ROAD SHOW ON EARTH!

MAMMOTH DIRT-EATERS

**EARTH-MOVING
GIANTS**

WORLD'S CHAMPION LOAD-LIFTERS

**WILD-TERRAIN
TAMERS**

**JIB
HEADED
CRANES**

Hurry, hurry, hurry to the greatest road show on earth—the American Road Builders' Association ROAD SHOW in Chicago, January 28 through February 2.

Step right up and see the "metal monsters" . . . new models of big-bite shovels, growling graders, roaring loaders and other road building equipment. Machines like these will soon be changing the map of the United States, building 41,000 miles of new roads for the projected INTERSTATE HIGHWAY SYSTEM.

C.I.T. Corporation cooperates closely with contractors and equipment distributors in the financing of road building equipment. For over 25 years, C.I.T. field men have worked on the site with contractors, gaining an invaluable insight into the financing requirements of road builders.

This experience, coupled with C.I.T. funds and specialized services, is ready to help with the tremendous road building project ahead. JOB-ENGINEERED finance plans—including depreciation-gear financing, equal monthly payment plans, lease and rental plans—are all available through any of the fourteen offices listed below. Write for information.

SEE US AT THE SHOW
BOOTH NO. 354
AVENUE A
ARBA ROAD SHOW

C.I.T. CORPORATION

MACHINERY AND EQUIPMENT FINANCING

416 West 8th St.
Los Angeles 14, Calif.

120 Montgomery St.
San Francisco 4, Calif.

Equitable Bldg.
Portland 4, Oregon



Mixed-in-place piles for cut-off wall

Overlapping mixed-in-place piles form water barrier on Bureau of Reclamation diversion dam.

By LOUIS A. GERDINE

Regional Engineer
Intrusion-Prepakt, Inc.
San Francisco, Calif.

INTRUSION MIXED-IN-PLACE piling are being used to make the cut-off wall under the spillway section of the Putah Diversion Dam, 3 mi. west of Winters, Calif. This method was used instead of steel sheet piling across the upstream face over an estimated area of 7,500 sq. ft.

First used by the Bureau of Reclamation on the Slaterville Diversion

Dam at Ogden, Utah, in September 1956, the mixed-in-place piling method was again called for on the Winters job.

Soil at the site consists of gravel, sand, and silt in the upper strata with a layer of impervious clay at an approximate depth of 16 ft. The gravel encountered had a size up to 1½ in. with the exception of a layer of 6-in. to 8-in. cobbles at 8 ft. to 10 ft. below grade.

The mixed-in-place piling method of constructing underground water cut-offs has been over ten years in development and in successful usage for several years. Originally devel-

oped and in use as a method of soil and foundation stabilization, the piling have proven very versatile because they can be placed to overlap each other, thus making effective cofferdams constructed without vibration, or water-tight walls such as the cut-off wall under the spillway structure.

The mixed-in-place cut-off wall at the Putah Diversion Dam permitted a minimum effective thickness of 12 in. which is accomplished by using a 17-in. diameter mixing head on the special equipment and spacing the piling 12 in. on centers. This assures a wall which is over the minimum and which due to the webbing effect is approximately 15 in. in thickness at the minimum point.

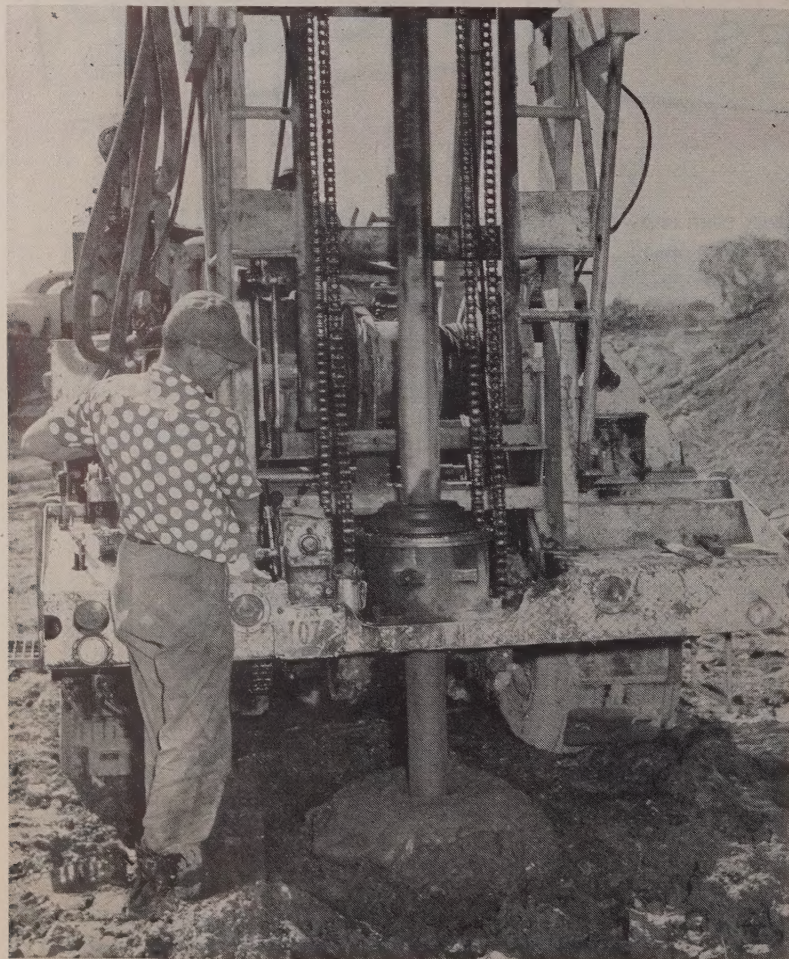
The depth for this cut-off wall is controlled by the impervious clay stratum underlying the spillway structure. A minimum penetration into the clay strata of two feet is required and to date this has required piling 12 to 19 ft. long. The tops of the piling are held two inches above the surrounding grade for the concrete to permit keying into the structure. Also, ⅝-in. reinforcing bars 5 ft. long are inserted 4 ft. into the pile to tie the wall to the structure above.

Highly mobile truck-mounted equipment was developed along with this method and it will handle mixing heads for piling varying from 12 to 24 in. in diameter which can be placed to depths of 60 ft.

Mixing of the Intrusion Grout and the in-place soil is performed on both the upward and downward travel of the mixing head to assure thorough mixing and filling of all voids. The amount of Intrusion Grout which is mixed with soil is dependent on the volume of voids in the material and will vary from 30% for fine sands and compacted clays to 60% for loose sands and soft clays. Normally, an Intrusion Grout batch consists of two bags of portland cement, one bag Alfesil and 15 gal. of water plus Intrusion Aid, a special admix to impart expansive and colloidal properties to the Grout.

Work progressed on a normal 8-hr. day basis and on the morning following pile placement it was possible to cut into the last pile placed and get a tight joint between succeeding day's operations.

Work on the Putah Diversion Dam is for the Bureau of Reclamation. B. P. Bellport is project construction engineer. George Pollock Company is the general contractor and Gus Windberg is superintendent for the contractor. Intrusion-Prepakt, Inc., is the subcontractor for construction of the cut-off wall, with Lawrence Trumbo as superintendent.



MIXING EQUIPMENT is mounted on truck, can mix piles in place in diameters from 12 to 24 in. and in depths to 60 ft. Voids are filled with grout, no material is removed.

CLINTON WELDED WIRE FABRIC... IN FAMOUS STRUCTURES EVERYWHERE



GRAND CENTRAL TERMINAL
EARLY 1900's — TODAY

well-built then — still in fine condition

When the famous Grand Central Terminal was erected in New York City in 1913, one million, three hundred thousand square feet of Clinton Welded Wire Fabric were used for the wrapping of its structural steel members.

Proof of Clinton Welded Wire Fabric's effectiveness in assuring durability is to be found in the excellent condition of the building today... almost fifty years after its construction.

Manufactured from wire drawn in our own

plants, from our own steel, under the highest standards of quality control, Clinton Welded Wire Fabric can be relied upon to provide maximum strength... minimize cracking damage... wherever welded wire reinforced concrete construction is indicated in modern construction.

It will pay you to consider using Clinton Welded Wire Fabric for concrete reinforcement on your next job. Call on the nearest District Sales Office to discuss your requirements.

WHEN THEY ASK...

"is it Reinforced"

SAY YES... WITH

CLINTON

WELDED WIRE FABRIC

THE COLORADO FUEL AND IRON CORPORATION



Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln (Neb.)
Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita



Colorado Springs water supply plan

The nation's highest dam in elevation and the first dam with an asphaltic face is a feature of construction program. City is spending \$18,000,000 to increase water supply to meet needs of soaring population, new Air Force Academy.

By J. S. NICHOLS
Water Superintendent
Colorado Springs, Colo.

and
G. R. SCOTT
Black & Veatch
Consulting Engineers
Kansas City, Mo.

A FIFTY PER CENT INCREASE in the population of Colorado Springs, Colorado, within the last ten years has resulted in water demands in excess of the capacity of the City's Pike's Peak supply and has forced the City to undertake an \$18,000,000 expansion program to develop an additional water supply, 75 mi. away on the western slope of the Continental Divide. The project includes diversion dams, collecting pipe lines, and tunnels to bring the water to a tunnel through the Divide, storage reservoirs and a 30-in. steel pipe line to transport the water to the city.

The drainage area above the intake of the West Slope Collection System consists of approximately 22 sq. mi., all of which lies above 11,000 ft. in

elevation, maximum elevation being 14,250 ft. The area is drained by the upper reaches of the Blue River and five tributaries, each of which originates near the top of the Continental Divide.

Construction of the collection and diversion system was begun in 1949. The first increment constructed was the Hoosier Tunnel, through which all diverted water is conducted through the Continental Divide from west to east. This tunnel is 7,788 ft. in length and has a horseshoe section 8 ft. wide by 9 ft. high. The west portal elevation is 10,989 ft. and the east portal 10,927 ft.

The tunnel was constructed in the period 1949 to February 1951, by the Douglas Jardine Co. of Colorado Springs, at a cost of \$491,245.

During this period, work was begun on the diversion structures and transmission facilities necessary to divert and conduct the waters of the Blue River and two of its tributaries, Hoosier and East Hoosier creeks, to the tunnel portal. Low earthen diversion dams with concrete spillways were erected across the streams and

approximately 10,000 ft. of open ditch was constructed to carry the diverted water.

Permafrost encountered

In the excavation of the ditches permafrost was encountered in some places. Because of high transmission losses in the ditches and difficulties involved in snow and ice removal in the spring, it was decided to install steel pipe in place of the open ditches.

A total of 2,020 ft. of 42-in.; 5,880 ft. of 36-in. and 2,140 ft. of 30-in. steel pipe was laid in the collection ditches and backfilled.

This work, together with the construction of concrete portal structures at the tunnel, forebays, measuring weirs and control gates was completed in 1953 by the Beer Coal & Construction Co. of Florence, Colo. Construction during this period continued through the winter months and despite very heavy snowfall and temperatures to minus 30 deg., all concrete work was satisfactory. Total cost of work during this period 1951 to 1953 was \$548,942.

In September 1954, Stolte, Inc., of Oakland, Calif., was awarded a contract for the construction of the Quandary Tunnel. This tunnel is 5,400 ft. in length with a horseshoe section 6 ft. wide by 8 ft. high. The tunnel was completed in 250 days at a cost of \$395,596.

Concurrently with the Quandary Tunnel construction, the other facili-



Do you need a
REALLY BIG
ASPHALT PLANT?

...Big enough to handle both BIG and
little jobs QUICKLY... with a WIDER
MARGIN OF PROFIT?

Check the
REALLY BIG
features of the
New **STANDARD**
Model R-B 6000 lb.
ASPHALT PLANT

REALLY BIG!

Not just a 6000 lb. mixer hung in a small plant—but a **REALLY BIG** plant throughout, with oversize screen, elevators and dryer, all teamed with the Standard Hi-Speed Pugmill.

RUGGED!

Massive pressed steel design, assuring **STABILITY** throughout the plant. (No H-beam columns used).

HEAVY WEIGHT!

HEAVIER shafts, **LARGER** bearings, **THICKER** alloy liner plates, **BIGGER** motors, combining to make a **TOUGHER** plant.

SIMPLE!

No gadgets to get out of order! **SIMPLE PUSH BUTTON CONTROLS** permit any operator to produce **AS HIGH AS 1800 TONS** IN AN 8 HOUR DAY without fatigue.

ECONOMICAL!

All moving parts are reduced to the absolute minimum, assuring rock-bottom maintenance costs.

STANDARD

ASPHALT PLANTS

... built to do a better job!

STANDARD STEEL CORPORATION

5049 Boyle Ave., Los Angeles 58, Calif. • 15 Park Row, New York 49, N. Y.

P.S. **HIGHWAY CONTRACTORS**

IT'S BIG... but
oh -- **SO PORTABLE!**

GET THE COMPLETE FACTS from your **STANDARD** DISTRIBUTOR.

Attention Contractors!

The New **STANDARD** Portable T. M. Plant offers top production. A complete self-contained batch type Asphalt Plant...on wheels. One man operates! Has exclusive "SELF-LIFT" erecting device. **RUGGED—ECONOMICAL—SIMPLE.** Mixes up to 60 tons per hour!



See us at the A.R.B.A. Road Show, Sec. AA-235, Jan. 28-Feb. 2, 1957



JETS wash rock as it is placed to prevent pockets of fines from forming supporting pads to permit excessive future settlement. Lifts were up to 30 ft. in height in main zone of dam.

ties required to divert and transport waters of McCullough Creek to the forebay of the Hoosier Tunnel were constructed.

The Blue River Syphon, consisting of 1,600 ft. of 52-in. steel pipe, connecting Quandary and Hoosier Tunnels, and the Quandary Tunnel Portal structures were constructed by the Mazzocco Construction Company of Colorado Springs. The McCullough Creek access road, diversion dam and 30-in. steel pipe line from the dam to the Quandary Tunnel inlet portal were constructed by Douglas Jardine Company of Colorado Springs. Total cost of these facilities was \$210,955.

First water from McCullough Creek flowed through the system on July 4, 1955.

Remaining to be constructed to complete the collection system are the 6,600-ft. McCullough Tunnel, its connecting piping and the Spruce and Crystal Creek Diversion Dams and pipe lines. It is expected that this work will be completed by 1960, at an estimated cost of \$750,000.

Dam is 2 mi. high

Montgomery Dam, which will form a storage reservoir of 5,100 ac. ft., and which can later be increased in height to provide storage for about 10,000 ac. ft., is located on the South Platte River just below Hoosier Tunnel and about ten miles northwest of Fairplay, Colorado. It is a rock dam, 1,850 ft. long, with a maximum height for the present construction of 113

ft. and containing 654,200 cu. yd. of rock. The elevation of the spillway is 10,861 ft. above sea level, at an elevation higher than any other dam in the nation. There is a roadway 20 ft. wide on the crest of the dam and the upstream and downstream slopes are 1.7:1 and 1.5:1 respectively.

The waterproof membrane on the upstream face is to be of asphaltic concrete, 12 in. thick. This is a departure from normal practices and is being adopted after two years of exhaustive study and experimental work.

The construction of the rock fill began in August 1954 and was completed in September 1956. Extreme cold weather at the site has limited the construction season to the six months period each year between May and October. The material for the fill is granite, quarried from the mountain slope just above the dam.

Fines in the main body of the fill were limited to not more than 10 per cent and no fines less than 3 in. in size were permitted in a layer 10 ft. thick measured horizontally on the upstream face of the dam. A Wobbler screen was used when necessary to remove the fines from the quarried material. The rock was hauled in trucks from the quarry and placed in the fill in lifts up to 30 ft. in height. Hydraulic jets were played on the active face of the fill as the rock was placed in order to prevent pockets of fines from forming supporting pads to permit excessive future settlement. The base for the asphaltic concrete membrane is formed of screened ma-

terial from $\frac{3}{4}$ to 3 in. in size, about 9 to 12 in. in thickness on the upstream face. After this material was placed it was smoothed by a dragline, using first a shovel and then a heavy steel bar drag. Compaction was accomplished by means of a vibratory roller operated on a cable from the dragline on the top of the dam.

Fisher Contracting Co., Phoenix, Ariz., was the contractor on this work. The total cost was \$2,250,000.

The waterproof membrane will be placed during the summer of 1957. It will require 26,500 sq. yd. of material. The aggregate for this work will be obtained from glacier deposits in the vicinity of the dam. It is estimated that the cost of this work will be about \$350,000.

Pipe line meets rugged terrain

A 30-in. diameter steel pipe line has been completed from the gate house at the dam to South Catamount Reservoir, one of the City's two storage reservoirs on the north slope of Pikes Peak. A line of 20 and 24-in. steel pipe, constructed in 1934-1935, connects with the city system at the hydro-electric station in Manitou, and a 24-in. steel line, constructed in 1955-1956, conveys water across Ute Pass and Rampart Range to supply water to the Air Force Academy and into the rapidly expanding northern section of the city.

The 30-in. steel line is lined and coated with bitumastic enamel in accordance with AWWA specifications. The thickness of the wall varies from $\frac{7}{8}$ in. to $\frac{1}{2}$ in. Operating heads of 20 to 1,970 ft. are experienced as the line crosses the rugged terrain between Montgomery Dam and the South Catamount Reservoir.

The construction began in 1952 and the first section of 17 mi. was completed in 1953. This extended from South Catamount Reservoir to the South Platte River at Lake George. At the beginning of the program it was anticipated that for the next ten years it would be more economical for the City to divert limited amounts of water from the western slope to the South Platte River and rent storage for it in one of the two storage reservoirs on Denver's water system, and pump it against a head of about 1,600 ft. into South Catamount Reservoir than to build the entire 70 mi. of line. Accordingly, a diversion dam 20 ft. high across the South Platte River and two pump stations, each containing two electric motor-driven 2-mgd. pumps and one gas engine-driven 1-mgd. pump, were constructed on the line; one at Lake George connected to the 30-in. line by a 16-in. line, and the other on the line at the center of the pumping head. The City's water demand grew so rapidly that an additional 2-mgd. electric motor-driven pump was installed in each station in 1954.

The selection of a site near Colorado Springs for the Air Force Acad-

It's time to compare . . . with **LINK-BELT SPEEDER**



Link-Belt Speeder gives you up to

40% more usable horsepower

greater line pull . . . bonus power to dig, hoist, swing, travel

Link-Belt Speeder machines are built to take full advantage of the "bonus" horsepower available in shovel-crane engines!

SIZE for size, a Link-Belt Speeder gives you more *usable* horsepower. You get more line pull, more power at the bucket teeth . . . more power to swing, hoist and travel. That's because a Link-Belt Speeder takes more power out of its engine!

You see, a Link-Belt Speeder is built with extra strength—strength to handle greater horsepower. Thus, the engine in a Link-Belt Speeder can be (and is) set to deliver the greater horsepower for which the machine is designed. Link-Belt Speeder

gives you a bonus of up to 40% *more usable horsepower than machines using the same make and model engine!* And, in every instance, the engine in a Link-Belt Speeder is run at speeds well within the manufacturer's recommendations.

How to compare

Your Link-Belt Speeder distributor will furnish complete specification information. Check sizes and materials in Link-Belt Speeder shovel-cranes that allow you to use the actual horsepower you are paying for. **LINK-BELT SPEEDER CORPORATION**, Cedar Rapids, Iowa.

14,248

LINK-BELT SPEEDER

Builders of a complete line of shovel-cranes . . . with exclusive Speed-o-Matic power hydraulic controls



emy made it imperative to complete the pipe line to Montgomery Dam immediately, and construction of the remaining 53 mi. was begun and completed in the summer of 1955. While no water could be stored behind Montgomery Dam in 1956, the line was used to transport water at the rate of 14 mgd. to the City during the 1956 diversion period. Its capacity, when the reservoir is completed, will be 18 mgd.

The pipe line for the first 17 mi. was lined and coated before being delivered to the job. The pipe, for the 53 mi. of line installed in 1955, was delivered and stockpiled near the right-of-way and a field plant was installed to apply the lining and coating to the pipe as it was needed during the construction operations.

In general, three sections of pipe, each 40 ft. long, were welded together on the bank of the prepared trench. The lining and coating were then repaired at the points and at any other places where damage had oc-

curred. The 120-ft. sections were then lowered in the trench and connected with Dresser couplings. It was covered with a minimum of 3 ft.

The fabrication of the pipe for the first 17 mi. was divided between Thompson Pipe & Steel Co. of Denver, and Bethlehem Steel Co. The construction work was done by Hutcheson Construction Co. The cost of this portion was \$1,778,000.

The pump stations and diversion dam were constructed by Mazzacco Construction Co., Colorado Springs, and Beer Coal & Construction Co., of Florence, Colorado. The cost was \$344,200.

Basalt Rock Co. supplied the pipe for the 53 mi. of line installed in 1955. R. H. Fulton & Co., Lubbock, Texas, was the prime contractor on the installation with Koppers Company, Inc., responsible for the pipe lining and coating operation. The total cost of this section was \$4,567,900.

Additional storage reservoirs on

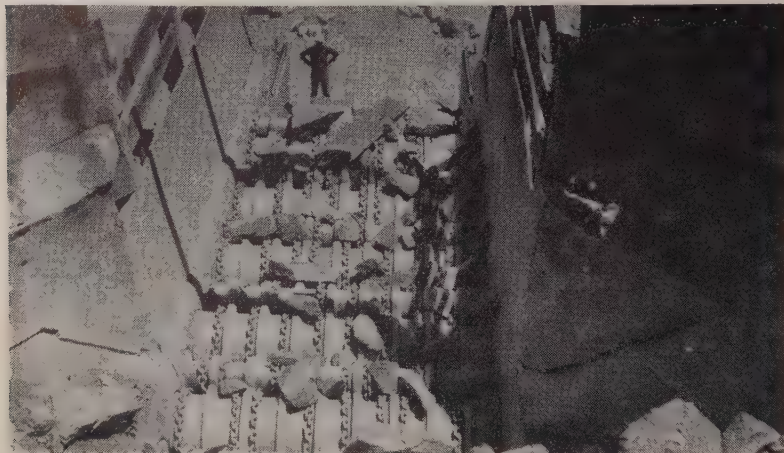
the western slope, increasing the height of Montgomery Dam and the construction of additional storage on the northern slope of Pikes Peak, is estimated to cost about \$6,500,000 more.

The engineering and supervision work in connection with the development of the supply on the western slope to the outlet portal of Hoosier Tunnel has been carried out by the Department of Public Utilities of Colorado Springs. R. D. Nixon is general manager of the department and J. S. Nichols is superintendent of Water Division. Black & Veatch, Consulting Engineers, Kansas City, Missouri, have been the engineers for the design and construction of Montgomery Dam and the 30-in. pipe line to the city. Dr. D. B. Gould, then with Colordao College, was employed by Black & Veatch as consulting geologist and F. W. Scheidenhelm, Consulting Engineer, New York City, as consultant on the design of Montgomery Dam.

New method speeds rock production



Scalper-feeder saves the day for Fisher Contracting Co. when rock source turns bad at Montgomery Dam in Colorado.



REMOVING FINES to meet tough rock specs was handled with a combination scalper-feeder called a Wobbler. Revolving oval bars move rock forward, allow fines to drop through. During a peak 20-hr. day the Wobbler produced about 250 cu. yd. per hr.

THE CONTRACTOR had plenty of problems at Montgomery Dam. At an elevation of 10,800 ft. above sea level the efficiency of both men and machines drops off. It's hard to measure the human element but efficiency dropped about 30% on gasoline engine equipment and about 15% on diesels. Another disadvantage of such a high elevation is the short working season—six months in this case.

The rock was a very abrasive granite that resisted working and chewed equipment at a fast rate. Shovel teeth lasted only 20 hr., and the maintenance schedules had to be stepped up for all equipment, especially crawlers and tires.

The biggest problem was meeting the tight rock specifications. These called for 90% rock over 4 in. in the zone 1; 100% free of anything less than 3 in. in the 10-ft. zone 2; and a 9 to 12-in. facing of from $\frac{3}{4}$ to 3-in. rock on the upstream face, which serves as a base for an asphaltic membrane to be placed next summer. The quarry from which the rock was taken contained more fines than the contractor had estimated and some middle-of-the-job replanning was required to meet the contract specifications. Originally, Fisher had planned to use a trommel screen to sift out the zone 2 aggregate. But when they

an into the situation where 70% of the material in the whole dam had to be run through the trommel to meet the specs the trommel was incapable of carrying the load. There were too many fines for it to handle, and the heavier rock caused fractures.

Fines had to be absent from the rock fill, especially in the support base adjacent to the asphaltic membrane so that water could have free passage. Any water retained by fines could damage the membrane by alternate freezing and thawing.

Fisher met the rock specs by using a combination scalper-feeder called a Wobbler, a product of Universal Engineering Corp. It was developed primarily for taconite mining in Minnesota's Mesabi range.

A set of bars in the bottom of a hopper gives a rocking, tumbling motion to the quarry materials dropped on them. The bars are oval in cross-section and set alternately vertical and horizontal. They maintain the same relative positions as they turn.

The effect is a thorough churning that separates the fines which fall through the bars and are carried away on a belt. The oversize feeds to the end of the Wobbler and is chuted into trucks.

The material carried away on the belt by the separating action is carried to a shaker screen which sifts it through $\frac{3}{4}$ -in. slots. Of the rock handled by this feeder 30% was fine material. About half of the fines were salvaged for use in the rock fill. The total waste from the quarry was about $7\frac{1}{2}\%$.

During a peak 20-hr. day the Wobbler handled an average of 250 cu. yd. an hour. Dump-loads with single pieces weighing 5 tons were dropped onto the Wobbler every 3 min. Some of the boulders were so heavy they would bounce out of the trucks when dumped into them from the discharge end of the Wobbler. The ability of the device to withstand such heavy treatment is due primarily to the fact that the oval bars are made of a very tough manganese steel.

The largest boulders were brought directly from the quarry to the dam. All rock was subjected to washing with two hydraulic monitors as it was dumped in place. The monitors discharged about 1,500 gal. per min. at 75-psi. nozzle pressure. Water for the guns was brought by gravity flow through a 16-in. pipeline from the Platte River channel.

Sealing off the fractured dam base is a grout curtain which extends 150 ft. below the dam and required more than 25,000 sacks of cement.

Material on the face of the dam was satisfactorily compacted by a vibratory roller. The roller was modified by the addition of automobile wheels and was pulled up the slope by a dragline cable.

The asphaltic membrane will be placed in the summer of 1957, under



MATERIAL was dumped directly onto the Wobbler (note size of rock being ejected at left). Revolving bars in Wobbler are made of manganese steel to withstand heavy beating.



BASE for asphaltic membrane on upstream face of dam was compacted with a vibratory roller modified by addition of rubber-tired wheels. A dragline pulled it up slope.



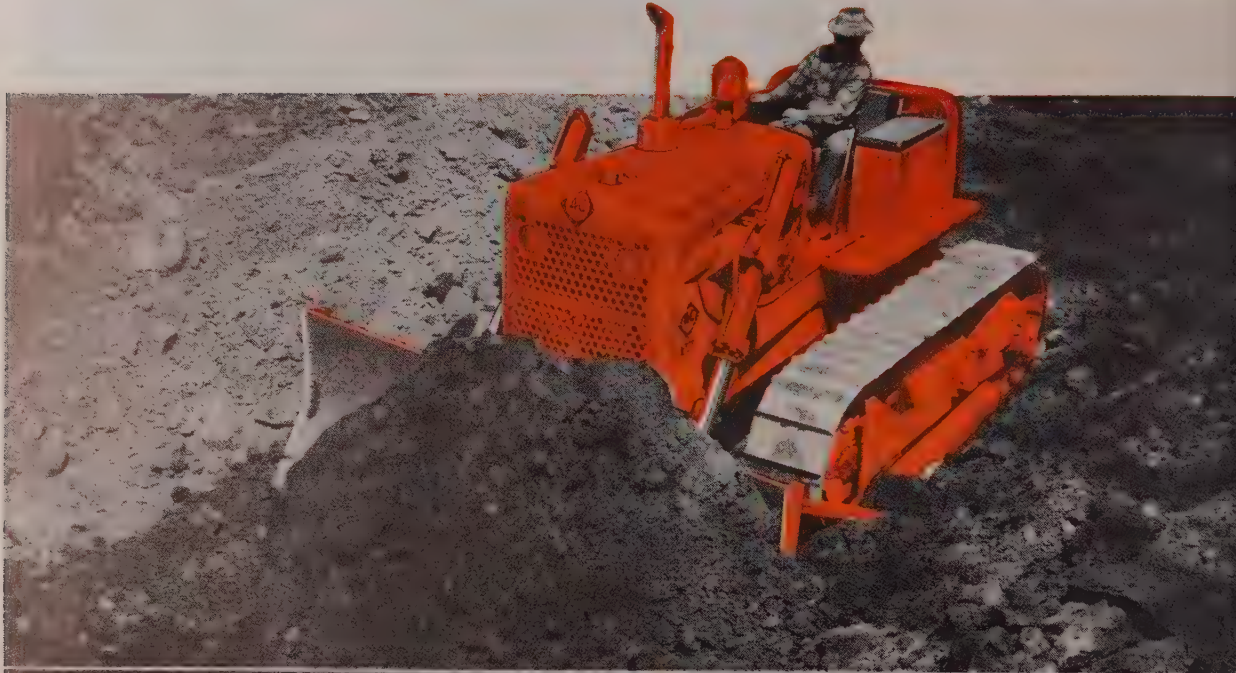
HIGH ELEVATION, 10,800 ft., caused machine efficiency to drop off (30% for gasoline engines). This is the highest dam in elevation in the nation, first with asphalt face.

a separate contract. The use of asphalt for this purpose is a departure from normal practice. The decision to use it was made by Black & Veatch, consulting engineers on the project, after a considerable amount of experimental work. The desire was to provide a waterproof membrane which was flexible and would not shear or crack. It is known that settlement occurs in rock-fill dams, and although it is not anticipated that

settlement will be excessive in this structure, it was desired to obtain a membrane which would be flexible and still prevent the passage of water and be permanent.

Fisher Contracting Company had a work crew of 140 men on the job working two 10-hr. shifts per day. Ken Willis was superintendent for the final year of the work with Ed Pound as project engineer, and Gus Zorke as maintenance foreman.

THIS KIND of CRAWLER



SEE YOUR **ALLIS-CHALMERS**



CONSTRUCTION MACHINERY DEALER

ARIZONA

Neil B. McGinnis Equipment Company—Phoenix

NORTHERN CALIFORNIA

Industrial Tractor Sales—Sacramento
Shasta Truck & Equipment Sales—Redding
Alkins Tractor Co.—Eureka and Willits

SOUTHERN CALIFORNIA

San Joaquin Tractor Co.—Bakersfield
Shaw Sales & Service Co.—Los Angeles and San Diego

IDAHO

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

MONTANA

Mountain Tractor Company—Missoula
Richland Machinery Company—Sidney
Seitz Machinery Company, Inc.—
Billings and Great Falls

NEVADA

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

OREGON

Haupt Tractor Company—
Medford and Klamath Falls
Wood Tractor Company—Portland

UTAH

Cate Equipment Company, Inc.—Salt Lake City

WASHINGTON

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

WYOMING

Studer Tractor & Equipment Company—Casper

TRACTOR DESIGN gives you

a **PLUS** in earth-moving output

..and only Allis-Chalmers Crawler Tractors have it...

advanced-design features
that combine big performance,
versatility, dependability and
simplified servicing!

Look at the advanced basic design of Allis-Chalmers crawlers—see how they're built to give sure-footed traction, better working balance. But there's more to these crawler tractors than meets the eye—the performance advantages of Allis-Chalmers advanced basic design. It provides more working power, more strength in all components, more working weight where it's needed... makes them outstanding performers with drawn or mounted equipment... easier to operate and maintain.

Let your Allis-Chalmers dealer show you how Allis-Chalmers crawler tractors can give you that extra output on your earth moving work.

FOR EVERY CONSTRUCTION JOB—YOUR CHOICE OF FIVE ALLIS-CHALMERS MODELS:

HD-21

204 net engine hp 44,000 lb (bare)
Torque converter drive

HD-16

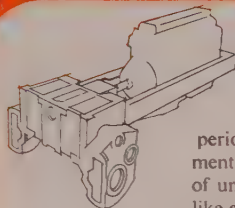
150 net engine hp 141 belt hp
39,000 lb approximate 31,500 lb (bare)
weight, as illustrated, left. Standard
Torque converter drive transmission

HD-11 above, left

94 belt hp
24,800 lb approximate
weight, as illustrated

HD-6

63 belt hp
12,600 (bare)



Special Strength and Protection

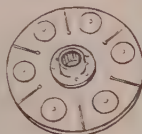
Exclusive all-steel, box-A main frame makes possible superior over-all balance, better equipment mounting... plus service simplicity of unit construction. Major assemblies like engine and clutch can be removed without disturbing adjacent parts. One-piece "wrap-around" radiator guard provides maximum strength for bulldozer mounting... complete protection for radiator.

Allis-Chalmers Heavy-Duty Diesel

Engine. The power plant is designed for big output, ample reserve capacity and low maintenance. Energy cell controls combustion timing and pressures for high efficiency. Tornado turbulence mixes air and fuel thoroughly for more complete burning. Follow-through combustion sustains effective working pressures to take advantage of better crankshaft leverage.

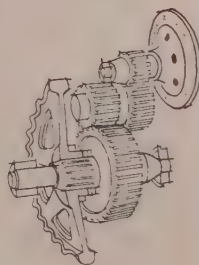
Extra Clutch Life—with Ceramic

Lining. Master clutches offer simple, single-plate, over-center design. Revolutionary new ceramic button clutch lining keeps clutch operating longer between adjustments... lengthens clutch life... reduces lever pull for easier operation.



Straddle-Mounted Final Drive Gears.

Tapered roller bearings support both ends of the final drive gear shafts. Smaller gears and shorter shafts (plus line-bored, one-piece case), provide better bearing and gear alignment, more strength, longer life. Double-reduction final drives provide greater ground clearance.



New Design, Heavy-Duty Track.

Long life under the toughest conditions. Side bars have more steel where it's needed... benefit from new heat-treating methods which make possible new standards of strength and hardness throughout for extra wearability.

OTHER OUTSTANDING FEATURES

At no extra cost, you get roller bearing truck wheels, idlers and support rollers; 1,000-hour lubrication intervals for truck wheels, idlers and support rollers; 24-volt direct electric starting; crankcase guard; bumper; and lights.



SETTING 33 x 4-ft. pretensioned channels with a 12-in. space for the poured-in-place closure. This closure, properly dowelled and keyed, provided a composite beam action of 19 in. for both the dead and live loads.

PRESTRESSED concrete roof channels and beams proved competitive on a reservoir just completed in one of San Diego's finest residential areas. The structural roof system features a 1½-in. thickness of top slab for economy, flat slab for appearance, composite beam for maximum headroom, and prestressed concrete for deflection control.

Local conditions and aesthetic requirements determined the structural plan of Del Cerro Reservoir. As flat a reservoir as possible was desired to keep it inconspicuous in its location on a hillside overlooking a quality residential area. Heavy rock excavation limited depth of an economical cut. Reservoir walls are conventional cantilevered concrete, poured in place. The rectangular shape was selected in an attempt to disguise the facility and simulate a building rather than a tank.

The roof system of channels, beams, columns, and cast-in-place concrete was done on a subcontract basis at a square footage cost which was more competitive than other types of concrete construction.

Casting the channels

The 33-ft. length channels were cast in series on the subcontractor's pretensioning beds, with a 2½-day cycle for 18 units, 9 on each half. In-

side pan forms for the 4-ft. wide channels consisted of a heavy block of concrete topped with cast-in nailer strips. Plywood was used to form the slab, and sheet metal was used to make the inside radius and turn down into the two side ribs. Outside forms were originally plywood, then modified with sheet metal skin early in the job to reduce labor costs. Outside forms incorporated a chamfer strip edge detail to provide adjacent channels with a grout key for transfer of vertical shear.

Of first importance in the design of inside forms for pretensioning work is allowance for a shrink fit at the time of release of the strand. At the moment of release, actual shortening

of the member is on the order of ¼ in. due to elastic deformation and accumulated shrinkage. End sections of the pan were therefore made collapsible to accommodate this movement. A secondary advantage of this design was the fact that creeping of the entire pan form (in line with release stresses) was absorbed in each unit, and was not cumulative throughout the series.

Strands "harped" down

One basic advantage of post-tensioning over pretensioning is the ease of getting the center of gravity of the steel down at midspan to a non-linear position. Pretensioning techniques are now developing to the point where this advantage narrows. In the case of the Del Cerro Reservoir channels, two strands were placed in each rib. The upper of the two strands was "harped" down 7 in. at midspan and struttled back in line by each end bulkhead.

Geometrically, the harped strand traveled 2½ in. more than the straight lower strand. As a result the lower strand was tensioned 2½ in. prior to tensioning the upper strand. The tie-down at midspan was a greased sleeve and bolt assembly conveniently tied to the block of concrete (inboard) and the casting bed (outboard). The tie-down reaction required to harp the 7 in. is on the order of ½ ton.

Pretensioning specifications (in San Diego area), in general, allow strand releases at anywhere between 2,400 and 4,500 psi. This is determined by either extreme fiber stresses or

Prestressed reservoir roof features design economy

Nine 33-ft. channel members cast in series with strand pulled down 7 in. at mid-span before stressing—Shallow supporting beams deepened to 19 in. with cast-in-place rib between channels.

By **RICHARD C. CLARK**
Southwest Structural Concrete Corp.
San Diego, California

DEL CERRO RESERVOIR

Capacity: 1½ MG.

Plan: 100 x 200 ft.

Channels: 3 spans at 33 ft.

Beams: 8 spans at 25 ft.

Columns: Conventional pre-cast concrete.

Concrete: 5,000 psi, 8 sk. Type III, ¾-in. max., 2-in. slump.

Prestressing steel: ¾-in. diam.

Roebbling 7-wire stress relieved strand.

f'c at release: 3,000 psi. at 48 hr. with positive end anchorage.

Casting bed: Nominal 330 ft., channels cast 9 series on each half.

2/A at time of release, and whether or not positive end-anchorage is specified.

The specification here required positive end-anchorage and required an f_c of 3,000 psi. at release, an average value when using positive end-anchorage. The anchorage on the strand used for this job is a mild-steel clip corrugated on the strand with a forming press and specially designed dies. It is marketed under the name "Dorland Clip" and was devised locally by the prestressed concrete subcontractor for both strand and solid wire, the former between $\frac{3}{8}$ and $\frac{1}{2}$ -in. diameter.

The composite beam design was used to save height on perimeter walls. Beams supporting the channels are 7 in. deep on a 25-ft. span and are prestressed. Between channel ends a 12 x 12-in. closure strip of 3,000 psi. concrete is cast-in-place. No forming was required. The cast-in-place section served to: (1) deepen the beam to 19 in., (2) accommodate negative steel, and (3) seal the roof deck.

Further advantages

Similar designs might be done more effectively by increasing beam capacity and using composite action for live load only, rather than both dead and live loads as was done here. This would eliminate expensive shoring procedures at a slight increase in material costs, and would appear worthwhile where long columns or sloping floors are present. Each case should be judged individually.

Columns were conventionally precast of reinforced concrete. Prestressing of these columns would be advantageous for eccentric loadings, extreme slenderness ratios, or severe exposure conditions. None of these was the case on this job, and no material would have been saved by prestressing.

PERSONNEL

Owner: Jackson & Scott, Inc., and The Vinley Corporation, developers of "Del Cerro."

General Contractor: Owner.
Consulting Engineer: Byrl D. Phelps.

Consultants on Prestressed Design: T. Y. Lin and Associates.

Prestressed Concrete by: Southwest Structural Concrete Corp.

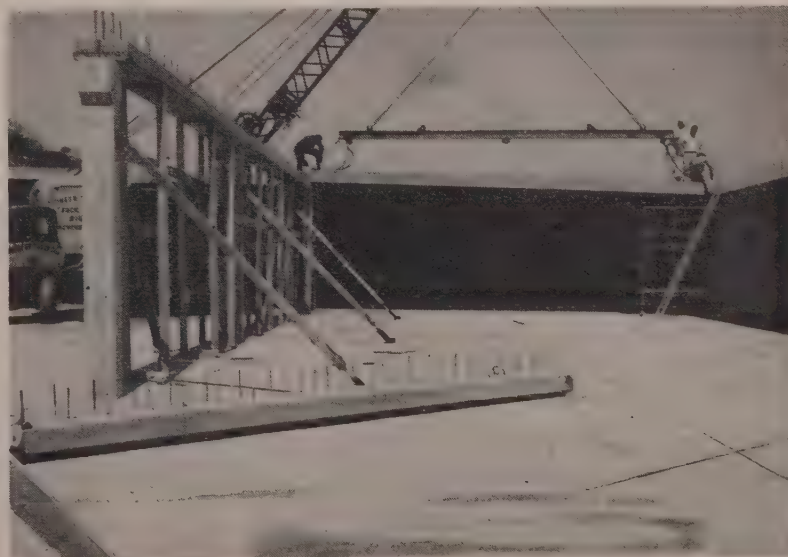
Design and construction as approved by the Water Department, City of San Diego: Paul Beermann, director, T. V. Huff, inspector.



CHANNELS were poured around concrete blocks, seen in background, with two pretensioned strands in each rib (flange). Feature of the tensioning was the hold-down device that depressed the top strand 7 in. at mid-point, requiring a force of about 1,000 lb.



VIBRATING SCREED and internal vibrators used in pouring the channels to secure uniform density for the 5,000-psi. concrete. Maximum aggregate was $\frac{3}{4}$ in. and slump 2 in. The top slab of the channel is only $1\frac{1}{2}$ in. thick. High early strength cement was used.



SPANNING 25 ft. between columns, the beams are only 7 in. deep. This makes shoring necessary until pouring the 12-in. space between channel ends provides composite action.

TS-18

"Eucs"

**TWIN-POWER SCRAPERS get
more work done...faster**



Harris Construction Co. of Aberdeen, S. D. recently set a new record for earthmoving on Montana highway work with a fleet of six TS-18 Euclid Scrapers. In a six-day work week these "Eucs" moved 90,000 cu. yds. on a half million yd. road contract near Nashua on Route 2. They worked 10 hours a day—self loaded gravel, clay and shale without pusher tractors—on hauls averaging 1500 ft. Most of the time each machine worked alone making shallow cuts and fills on sections of the 13-mile job.

At nearby Glasgow Air Force Base, Harris used his original fleet of four TS-18 "Eucs" to move most of the 1,200,000 yds. of gumbo. Working two 10-hour shifts 6 days a week, each scraper averaged 69,000 yds. a month. Performance of the "Twins" on this air base job was so outstanding that 2 more were added to the Euclid fleet—and Harris has disposed of 8 other scrapers and 5 crawler tractors.

With two jobs only 26 miles apart the mobility and independence of the TS-18 Scrapers proved a big advantage. They moved from air base to road job and back again—as conditions required—in about an hour. There was no problem or expense in moving pusher tractors because none were needed at either job. And when a few loads of sand or gravel were needed for culverts or other use, a "Twin" or two took off for the nearest pit and did the job in a hurry.

Owner Ken Harris has found the Twin-Power Scraper the most efficient dirt mover he's ever used. His fleet with job availability of 95% has more than lived up to his expectations in production and low cost yardage. That's why he tells visitors to his jobs, "When I buy additional haulage equipment it'll be TS-18 'Eucs'".

For information on the complete line of Euclid earthmoving equipment, call your Euclid dealer—he can show you why *Euclids are your best investment.*

Twin-Power—two engines driving separate axles—was pioneered by Euclid 10 years ago. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power matched to any job condition. The TS-18 is powered by two 218 h.p. engines with a 300 h.p. engine for the tractor available for work where maximum power can be used. Standard tires are 27.00 x 33 with 33.5 x 33 as optional. Harris Construction Company's "Twins" are TS-18 Specials with 518 h.p. and the larger tires.



With a total of 518 h.p.—300 h.p. in the tractor and 218 h.p. in the scraper—Harris' TS-18 Specials really made the dirt fly and completed the Glasgow Air Force Base grading weeks ahead of schedule.



t new earthmoving records

... complete tough jobs way ahead of schedule

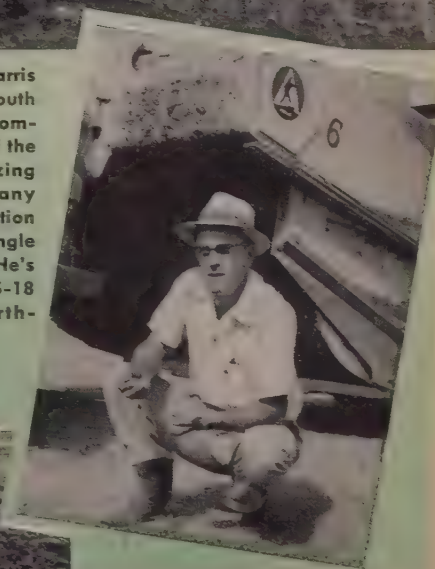


On one section of this Montana highway job a TS-18 working alone averaged 450 yds. per hour. Haul was 200 ft.—heaped loads of 17 bank yards were picked up in less than a minute.

The 33.5 x 33 tires and NoSpin differentials of the TS-18 Specials provided the tremendous traction needed for self-loading the heavy gumbo and gravel and made efficient use of the 518 total h.p. on both of the Montana jobs.



Ken Harris, head of Harris Construction Co. in South Dakota, says "the complete independence of the 'Twin' is revolutionizing road building on many jobs where concentration of equipment in any single cut is not practical." He's standardized on the TS-18 Special for his earthmoving equipment.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE





Pilot Knob hydroelectric plant nears completion

Imperial Irrigation District adds to hydro potential of All American Canal with addition of the \$6,600,000 Pilot Knob plant.

By RANBIR SINGH

Job Engineer
Gunther-Shirley-Lane
Engineers-Contractors

ANOTHER STAGE in the development of the hydro potential of the All American Canal in southeastern California is being brought to fruition by the Imperial Irrigation District.

Its \$6,600,000 Pilot Knob hydro plant, now nearing completion, is located about 5 mi. west of Winterhaven at a point where the Canal on its course to the Imperial Valley swings to within 2,000 ft. of the Colorado River. Here a 55-ft. head differential is utilized to develop 33,000 kw. with two vertical hydraulic turbine-generator units. Soil analysis and accurate forecasting of its probable behavior by Dames & Moore of Los

Angeles greatly facilitated design as well as construction planning.

Adequate timing of the procurement by the District of principal equipment totaling approximately \$3,200,000 brought these items to the site in such sequence as to avoid the slightest delay or impedance to construction. Probable deliveries tabulated in the general construction specifications aided bidders in their estimates of the situation.

Construction was advanced at least six months by the letting of a contract for site preparation which comprised an access road from U. S. No. 80, a plant spur and set-off track from the Southern Pacific, a shoo-fly around the site of the bridge carrying the railroad across the intake canal, 160 ft. of runway for a 110-ton gantry crane at the end of the spur, and all powerhouse excavation down to ground-water elevation at 28 ft. below original ground surface. During this phase the gantry crane was also installed and made usable for

subsequent unloading and construction. These factors also aided bidders on the general construction and subsequently went far in making possible the 600 calendar-day time limit for the "usable date of facility."

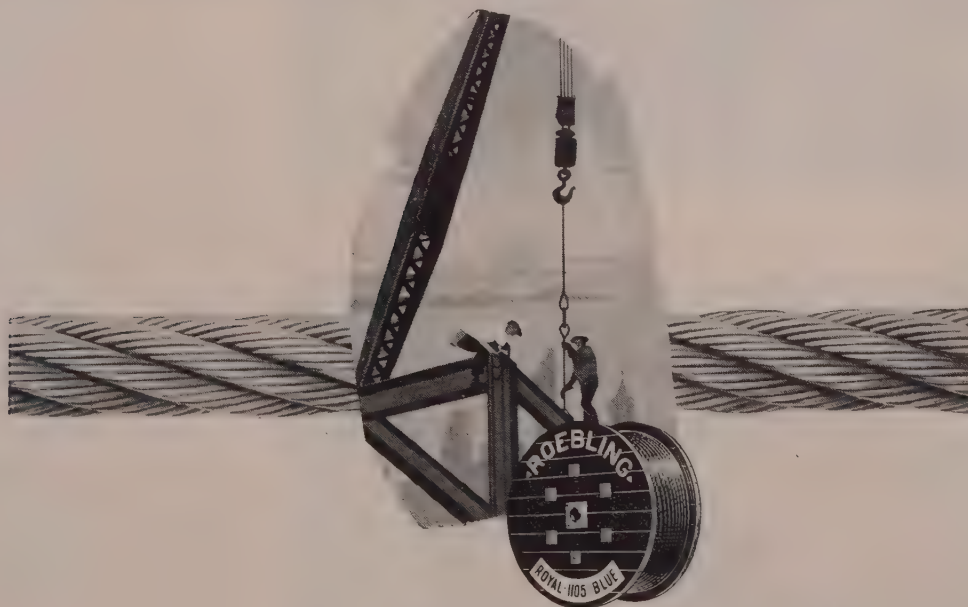
The accompanying aerial photograph illustrates the general layout. Access road, batching plant, District warehouse and storeyard, and railroad spur are seen in the upper right. Contractor's office, shops and 110-ton gantry crane, to the left of these. At the top, the Canal, the foundation pits for service road bridge across intake, railroad shoo-fly, final pour in progress on the railroad bridge, intake canal excavation, intake structure, penstocks, powerhouse and tail-race. To the left of these are the existing control works and spillway, viewpoint (graded area) for "sidewalk superintendents", and in the foreground Rockwood Heading, the original control from the river to the old Alamo Canal which was the early course of irrigation water, via Mexico, to the Imperial Valley irrigation system.

Design of the powerhouse fixed the roof at general site grade with the gantry rails extending across the roof to the high tension substation. In order to render the crane usable for installation of the heavy turbine and generator components the east wall was designed to take backfill pressures without intermediate bracing between the turbine room level (elev. 120.0) and the roof level (elev. 145.0). Thus the backfill necessary for

strong

Roebeling's finest!

Royal Blue's extra strength
vastly increases...even doubles...
wire rope service life



John A. Roebeling's Sons Corporation, Trenton 2, N. J., Subsidiary of The Colorado Fuel and Iron Corporation BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 81 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 2340 GLENDALE-MILFORD RD., EVENDALE • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • PITTSBURGH, 1723 HENRY W. OLIVER BLDG. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK 6.





SECOND DRAFT TUBE is being set at elevation 70. Normal groundwater is at elevation 113. Site was dewatered by six carefully positioned deep-well pumps discharging 4,500 gpm.



POWERHOUSE has advanced to the roof of the scrollcase. In the background are the six penstocks and the intake structure. Note deep well pump in center foreground.



PLACING RUNNER assembly of turbine in pit took place last July. Size of crane can be estimated by noting men at lower right. Completion date for project: Dec. 23, 1956.

crane-rail footings could be brought up not far behind the concrete progress of the wall. Assembly areas for the machines during construction and subsequent operation are provided east of the powerhouse within the gantry runway.

The specifications permitted the contractor to devise its own methods of caring for water during construction. Bottom of excavation was at elev. 60.0 (57 ft. below groundwater). It was successfully carried out in the dry, without sheeting or bracing, by means of six carefully spotted deep-well pumps having a combined capacity of about 4,500 gpm.

Concrete placed at night

Because of climatic conditions in this region the specifications required approved cooling measures for concrete mixing between June 1 and September 30. Therefore a closely coordinated program of form-work and reinforcing steel placement on the day shift with concrete placing on the night shift was adopted in order to "beat the heat." Gravel and sand having been processed from deposits about two miles north of the site and stock-piled close to the batch plant the first powerhouse concrete was placed Sept. 26, 1955, and the powerhouse walls were topped out by April 21, 1956. Of the 148 working days between these two dates only two were lost, and these because of sand storms. Contributing materially to this rapid progress, considering the complex nature of draft tube and scroll case designs, were the block pours and permissible construction joints amply detailed on the drawings. The mobility and range of the contractor's 75-ton crawler crane with 100-ft. boom, abetted by a 25-ton truck crane with a 60-ft. boom also figured heavily.

As can be seen from the photograph the progress on all other features of the project bespeaks the results of close planning and maximum use of adequate, modern tools. The site-preparation contract, begun Nov. 8, 1954, and completed April 22, 1955, was accomplished expeditiously for the same reason. All concerned look confidently for completion by the stipulated Dec. 23, 1956, deadline.

The project is under the direction of B. A. Weiss, Executive Engineer and General Superintendent of the Imperial Irrigation District.

Design, specifications and supervision of construction are by Gibbs & Hill, Inc., Consulting Engineers, under C. C. Kohlheyer, project manager, R. C. Sumner, resident.

The site preparation contract was executed by Morrison-Knudsen, under J. E. Ricker, project manager, W. C. Burns, superintendent.

Gunther-Shirley-Lane, a joint venture, is carrying out the general contract, under E. E. Ashlock, project manager, R. B. Summers, superintendent.



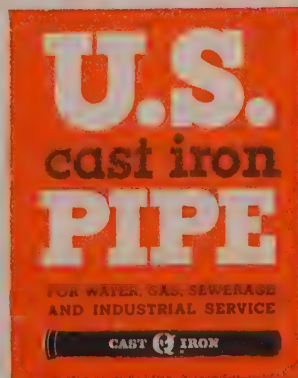
Huge solar engines imprisoning the heat of the sun may create islands of fertility in icy wastelands, thus vastly increasing the productive food areas of the earth.

100 years from now...

WE MAY GROW ORANGES AT THE POLES!

What will the world be like generations from now? Wonderful new products and methods will make living easier, pleasanter, safer. But in this marvelous new era, one old friend will still serve efficiently. Water and gas will be carried by rugged cast iron pipe laid today. For more than seventy American water and gas utilities, cast iron mains over a century old are still serving dependably. And modern cast iron pipe ...centrifugally cast and quality controlled...is far tougher and more durable.

U.S. Pipe is proud to be one of the leaders in a forward-looking industry whose service to the world is measured in centuries.



U. S. PIPE AND FOUNDRY COMPANY, General Office: Birmingham 2, Alabama

A WHOLLY INTEGRATED PRODUCER FROM MINES AND BLAST FURNACES TO FINISHED PIPE.



Here's the business end of a heater

When you buy a heater, don't stand in front of it; stand behind it. All heaters are hot in front, but their value to you depends on the rear end.

If you want *circulated warm air indoors, powerful spot heating outside, if you want to dry plaster, pour and cure concrete and keep the job rolling* in any weather, you need a Master heater.

It's a compact furnace-on-wheels, with starter, fan, thermostat, filter, pressure atomizing burner, insulated fire chamber and all. It rolls into place, starts at the flip of a switch, needs no vent and burns low cost kerosene or fuel oil.

We think it gives you more good heating for your money than any other type heater. Write for the free folder "Summer Warmth in Winter" or call your Master Distributor and see if you don't agree.

MASTER VIBRATOR COMPANY

1752 Stanley Ave., Dayton 1, Ohio

MASTER

DISTRIBUTORS

ANDREWS EQUIPMENT COMPANY.....Spokane, Washington

ANDREWS MACHINERY OF WASHINGTON, INC.....Seattle, Washington

C. P. CONCRETE EQUIPMENT COMPANY.....Inglewood, California
Oakland, California

NEW MEXICO EQUIPMENT COMPANY.....Albuquerque, New Mexico

OREGON RENTAL & EQUIPMENT SALES CO.Portland, Oregon

POWER EQUIPMENT COMPANY.....Denver, Colorado

SHRIVER MACHINERY COMPANY.....Phoenix, Arizona

SIERRA MACHINERY COMPANY.....Reno, Nevada

WORTHAM MACHINERY COMPANY.....Casper, Cheyenne, Newcastle,
Riverton, Rock Springs and Sheridan, Wyoming

Structural Design Chart—V



By
THOMAS HARAN
Civil Engineer

HAVING PRESENTED the first four sheets illustrating the author's interpretation of the structural analysis requirements for floor members of ACI 318-51, we commence the presentation of the structural design requirements with the sheet on the opposite page, which covers floor slabs. While the illustrated data on this sheet are self-explanatory and generally familiar to most structural designers, it may be helpful to comment on a few of the less obvious points.

Flat slabs and rib slabs have been shown with sloping surfaces in various places so that the designer is reminded that there is no specification in the Code requiring that these surfaces be designed horizontally or vertically.

Where t_1 , t_2 and t_3 are indicated on the sheet they are to be taken as they are defined in the Code, i.e. t_2 is not necessarily the thickness of slab in span L_2 (this is self-evident when one observes that t_2 also appears in span L_3); t_2 is, as defined in the Code, the "thickness of flat slab without drop panels, or the thickness of flat slab through the drop panels where such are used."

In the middle of the section on "Flat Slabs" at the top of the sheet, the effective steel area of a bar askew to the slab strip is shown schematically, which is indicated by the approximation sign next to A_s meaning that it is proportional to the bar diameter; however, the effective A_s is to be taken, as indicated on the sheet and in the Code, equal to " $A_s \cos \alpha$ ".

The "c" indicates minimum concrete cover of reinforcing bars which varies according to exposure; various values of "c" are tabled on Sheet 12, "Miscellaneous Supplementary Data," which will be published in the future.

Next month, **Western Construction** will present the sixth sheet of this series—"Structural Design of Floor Beams."

California adopts a record highway budget

AN ALL-TIME RECORD highway budget providing more than \$350,000,000 for major construction purposes for the 1957-58 fiscal year—an increase of more than \$100,000,000 over the budget adopted a year ago—has been announced by the California Highway Commission. Construction items in the new budget include \$220,439,000 for major projects, including construction engineering; \$127,623,057 for rights-of-way; and \$6,000,000 for contingencies, which normally is allocated later for construction purposes.

By comparison, the budget for the previous fiscal year contained approximately \$250,000,000 for major construction purposes, including rights-of-way. That budget was augmented in August 1956, by approximately \$63,000,000 as a result of additional Federal aid.

The over-all total budget adopted by the Commission amounts to \$464,247,288, of which \$421,062,057 is for State highway purposes.

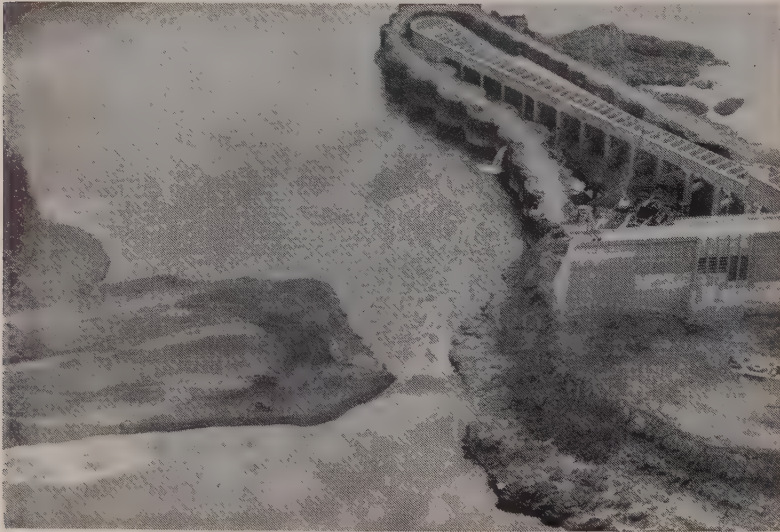
In addition to the \$354,062,057 for construction, rights-of-way and contingencies, the State highway allocations in the budget include \$25,000,000 for maintenance, 25,500,000 for preliminary engineering, \$2,000,000 for the statewide highway planning survey, \$7,500,000 for administration, \$4,500,000 for buildings and plants and \$1,750,000 for honor camp projects.

The non-state highway items in the budget include \$30,187,000 for major city streets ($\frac{1}{2}$ ¢ per gallon of the gasoline tax); \$7,920,000 in Federal Aid Secondary funds for county roads; \$4,087,854 in state highway matching funds to assist counties in the required matching of F.A.S. proj-

ects; and \$904,000 to cities for engineering work.

Federal Aid, still further increased, accounted for most of the additional funds in the 1957-58 budget, along with a normal rise in highway user tax revenues collected by the state. For 1956-58, California will receive approximately \$134,000,000 in Federal Aid for State highways, plus nearly \$8,000,000 in Federal funds for county roads on the F.A.S. system. Prior to the 1956 Federal highway legislation, California's largest Federal apportionment had been \$40,000,000 for state highways and \$7,000,000 for county F.A.S. roads.

State Highway Engineer G. T. McCoy informed the commission that some of the newly budgeted projects would be advertised for bids within the next few weeks. State law permits the awarding of state high-



Diverting the Columbia at The Dalles

CHANGING THE COURSE of the Columbia River and marking a milestone in construction of The Dalles Dam near The Dalles, Oregon, the first step in constructing the rock-fill dam, closing the main stem of the Columbia River at the project site was completed recently by the Port-

land District, Army Corps of Engineers.

The effect of the closure was to divert the total stream flow through the eight skeletonized units of the powerhouse. Starting Sept. 10, with two shifts working, Atkinson-Ostrander Construction Co., placed

quarry-run rock in the main river channel at the rate of approximately 9,000 cu. yd. a day. The material was end-dumped into the river to block the natural course of the stream and force it into the new channel.

The rock-fill barrier progressed from the Oregon shore to the Washington shore, and as the dumping of the material continued across the river the intake gates of the powerhouse units were opened to allow the increasing flow through the units. Accordingly, the volume of stream flow in the natural channel decreased progressively as the operation advanced toward full closure.

The contractors' efforts will now be aimed at elevating the closure section and sealing the front face of the dam with impervious materials. The top elevation of the closure dam when completed will be 185 ft. above mean sea level, or approximately 275 ft. above the river bed. The base width of the dam will be 1,100 ft.

Approximately 300,000 cu. yd. of rock were in place at the time the channel was closed. When completed to top elevation, the closure section will contain about 3,500,000 cu. yd. of material. This section will support the rail and roadway connections between the powerhouse, intake deck and tailrace deck of the project and the Oregon shore.

Euclid Scrapers and Crawlers are your best investment



Overhung engine type Scrapers of 7, 12 and 18 yds. struck capacity

Powered by engines of 143, 218 and 300 h.p., these scrapers are the fastest selling line in the industry. Advanced design of Euclid's hydraulic lever action, bowl and cutting blade provides fast, easy loading. The 18 yd. model has Torqmatic Drive . . . all have NoSpin differential and Euclid planetary drive axle . . . unequalled accessibility of power train and major components.

Four-wheel Tractor Scrapers

These 12 and 15.5 yd. scrapers have maximum stability for high speed hauls and rough roads. At 3:1 slope heaped capacity is 14 and 18 yds. A 200 or 218 h.p. engine with 5-speed transmission powers the 12 yd. scraper . . . drive tires are 21.00 x 25 standard with 24.00 x 25 optional. The 15.5 yd. scraper has 300 h.p. engine with 10-speed transmission or Torqmatic Drive . . . standard tires are 24.00 x 25 with 29.5 x 25 optional . . . a 17 yd. bottom-dump trailer is interchangeable with this scraper.



Your Euclid Dealer will be glad to provide information on the complete line of "Euc" Rear-Dumps, Bottom-Dumps, Scrapers, and Crawler Tractors

EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio



TC-12 Twin Crawler

A completely new concept in tractor design and performance, this Euclid tractor has two 194 h.p. engines (388 h.p. total) with a separate Torqmatic Drive for each track. Changing from one speed range to another (top speed of 8.3 mph) or to one of the three reverse speeds can be done under full power. Available drawbar pull is equal to or greater than gross weight. Planetary drives can be serviced without removing track, frame or drive sprocket.



Twin-Power "Euc" Scraper

The Model TS-18 is powered by two engines with a total of 436 or 518 h.p. It is a one-man earthmoving crew . . . self-loads and works under conditions that stop other scrapers. Tractor has a 218 h.p. or 300 h.p. engine with Torqmatic Drive . . . scraper wheels are driven through Torqmatic Drive by a 218 h.p. engine. Tires are 27.00 x 33 with 33.5 x 33 optional. Heaped capacity at 3:1 is 21 yds.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



way contracts as early as Jan. 1, six months before the start of the fiscal year. This provision enables the Division of Highways to make use of favorable construction weather, which means earlier opening of road improvements to traffic.

In addition to extension of freeway systems in the state's metropolitan areas, the new budget provides for many miles of intercity freeways, and expressways, and numerous sections of modern two-lane highways. Nearly 70 mi. of two-lane highway projects in the budget are to be built as initial units of ultimate four-lane freeways or expressways, with access control already provided and enough right-of-way for the remaining two lanes and a median strip to be added later. One of these two-lane projects on an ultimate freeway basis consists of nearly 18 mi., on State Route 90 in Solano and Yolo counties.

Area by area

Significant features of the 1957-58 state highway budget include:

San Francisco Bay Area—the final unit, in Oakland, of the 38-mi. Eastshore Freeway from the Bay Bridge to San Jose; in San Francisco, extension of the Central Freeway (U. S. 101); the Walnut Creek Bypass freeway in Contra Costa County; and further construction of the Bayshore Freeway in Santa Clara County.

Los Angeles Metropolitan Area—completion of the Long Beach Freeway from the Santa Ana Freeway to Pacific Coast Highway; a start on the Olympic Freeway (two projects in downtown Los Angeles); first downtown Los Angeles unit of the Golden State Freeway; continuation of the Golden State Freeway in the Burbank area; widening of portions of the Hollywood and Santa Ana freeways; further extension of the Hollywood Freeway into the San Fernando Valley; extension of the San Diego Freeway in the Culver City area.

In the San Diego area, current emphasis is on conversion of expressway sections of U. S. 101, U. S. 80 and U. S. 395 to full freeways by construction of interchanges. The Highway 94 freeway is being extended further into the San Diego downtown area.

In the Sacramento metropolitan area construction will begin soon on two previously budgeted projects, one a \$2,250,000, 6-mi. freeway job on U. S. 50-99 south of Elk Grove Road and the other a \$1,400,000, 14-mi. widening of U. S. 50 east of Sacramento.

The longest single full freeway project in state highway history—29.4 mi. on U. S. 66-91 from Victorville to Barstow—is included in the new budget. Together with a new 11.1-mi. freeway project in and north of San Bernardino, this will provide

Advance bid call schedule

Bureau of Reclamation releases data on construction plans

ARIZONA

Glen Canyon Unit, Colorado River Storage Project

NOVEMBER—Steel arch highway bridge with a single span 1,028 ft. long across the Colorado River near the Glen Canyon Dam site, about 165 mi. north of Flagstaff.

JANUARY—Glen Canyon Dam and Powerplant, a 4,770,000-cu. yd. concrete arch structure 700 ft. high and 1,400 ft. long, and a 900,000-kw. powerplant about 665 ft. long, 112 ft. wide and 160 ft. high.

CALIFORNIA

Trinity River Diversion, Central Valley Project

NOVEMBER—Trinity Dam, a 30,000,000-cu. yd. earth and rockfill structure 2,430 ft. long and 465 ft. high on the Trinity River about 45 mi. northwest of Redding.

Solano Project

FEBRUARY—Putah South Canal, about 8.7 mi. of 7-ft. bottom width concrete-lined canal, about 5 mi. north of Fairfield.

JUNE—Putah South Canal, about 5.8 mi. of 5-ft. bottom width canal west of Fairfield.

Ventura River Project

JANUARY—Robles Casitas Diversion Canal, about 5¼ mi. of 500-cfs. capacity, concrete-lined canal about 13 mi. north of Ventura.

COLORADO

Paonia Project

MAY—Paonia Dam, a 1,000,000-cu. yd. earthfill structure 166 ft. high and 660 ft. long on Muddy Creek about 6 mi. east of Somerset.

Colorado-Big Thompson Project

MARCH—The 4,500-kw. Big Thompson Power Plant near Loveland, Colo.

MONTANA

Helena Valley Unit, Missouri River Basin Project

OCTOBER—The 300-cfs. Helena Valley Pumping Plant near Helena; Helena Valley Tunnel, a 7-ft. diam. concrete-lined horse-shoe tunnel about 2.6 mi. long, 15 mi. east of Helena.

JANUARY—Helena Valley Canal, 8 mi. of canal with a 14-ft. bottom width, east of Helena.

APRIL—Helena Valley Canal, 24 mi. of 350 to 55-cfs. capacity canal north of Helena.

NEW MEXICO

Middle Rio Grande Project

JUNE—Rehabilitation of Angostura Diversion Dam about 6 mi. north of Bernalillo.

OREGON

Rogue River Basin Project

OCTOBER—Howard Prairie Dam, an 86-ft. high, 990-ft. long earth and rockfill structure on Beaver Creek about 27 mi. east of Ashland.

UTAH

Central Utah Project

MAY—Stenaker Dam, a 1,950,000-cu. yd. earthfill structure 138 ft. high and 1,800 ft. long on Stenaker Draw about 3.5 mi. north of Vernal.

Flaming Gorge Unit, Colorado River Storage Project

MARCH—Flaming Gorge Diversion Tunnel, 1,200 ft. of unlined diversion tunnel 26 ft. in diameter.

Weber Basin Project

NOVEMBER—Uintah Bench Pipe Laterals and Pumping Plant, 14 mi. of 8 to 36-in. concrete and steel pipelines, and one pumping plant, south of Ogden.

MAY—Willard Dam, an earthfill structure 32 ft. high and 11 mi. long on the Great Salt Lake about 11 mi. northeast of Ogden.

WASHINGTON

Columbia Basin Project

JANUARY—85 mi. of laterals and wasteways and 8 small pumping plants for Irrigation Block 20, 10 mi. northwest of Mesa.

MARCH—50 mi. of laterals and wasteways for Irrigation Block 82 about 10 mi. northeast of Beverly; Wahluke Canal, 3 mi. of concrete-lined and 4 mi. of unlined 594-cfs. canal 9 mi. south of Othello.

WYOMING

Oregon Trail Division, Missouri River Basin Project

OCTOBER—The 48,000-kw. Fremont Canyon Powerplant and Pressure Tunnel about 40 mi. southwest of Casper. The tunnel will be 3 mi. long and 18 ft. in diameter, and lined with concrete.

The "EXTRAS" are STANDARD on Bucyrus-Erie Transit Cranes

Any two carrier-mounted cranes look very much alike. You can tell the difference only by an extensive comparison of features. When such a comparison is made, Bucyrus-Erie Transit Cranes top the field because so many features that are "extras" at additional cost on other cranes are furnished as standard equipment on Bucyrus-Erie machines. Here's a rundown of such features and what they can mean to you on your lifting crane jobs:

Power controlled lowering for main hoist line on lifting crane permits delicate positioning of loads.

Friction swing brake, in addition to regular swing lock, permits more accurate spotting and holding of boom point over desired position.

Power controlled boom hoist, fully independent of all other functions, provides high accuracy boom control in crane work.

Safety boom stops, designed to prevent boom from accidentally snapping over center and striking cab, are furnished on all machines equipped for lifting crane service.

Pendant-type boom suspension with 8 parts of operating line between bridle and boom point is ideal for changing boom lengths conveniently.



Driving piling for a new interstate bridge near Portland, Ore., is this Bucyrus-Erie 22-B Transit Crane. Consolidated Freightways of Portland owns the machine.

Open-throat boom design permits easy rigging of multi-part lines.

Extendible outriggers, two on each side of carrier chassis, provide added stability for swinging capacity loads.

Transit Cranes are offered in two sizes — the 15-ton Model 15-B and 25-ton Model 22-B, readily convertible to 1/2- and 3/4-yd. excavators respectively. See your nearby Bucyrus-Erie distributor for full information on the size machine you need. Bucyrus-Erie Co., South Milwaukee, Wis.

223E56-1

SEE US FOR COMPLETE INFORMATION

The Border Machinery Company El Paso, Texas; Carlsbad, N. M.
Clyde Equipment Company Portland, Ore.; Seattle, Wash.
The Colorado Builders' Supply Company Denver, Colorado; Casper, Wyoming
Crook Company Los Angeles & Bakersfield, California
Great Northern Tool & Supply Company Billings, Montana
Intermountain Equipment Company Boise & Pocatello, Idaho; Spokane, Washington

R. L. Harrison Company, Inc. Albuquerque, New Mexico
Lang Company, Inc. Salt Lake City, Utah
Northern Commercial Company
(For Alaska & Yukon Territory) Seattle, Washington
West Coast Engine & Equipment Company Berkeley, California
Westmont Tractor Company Missoula & Kalispell, Montana
Tractor Equipment Co. Reno, Nevada
Road Machinery Company Phoenix, Arizona



See You at the ROAD SHOW • CHICAGO, Jan. 28- Feb. 2, 1957

70 mi. of continuous freeway and expressway from San Bernardino to Barstow.

On U. S. 99 between Los Angeles and Sacramento, the major projects budgeted include the conversion of the Grapevine Grade in Kern County to an eight-lane full freeway. Nearer the Oregon line, an additional 6.9 mi. of freeway are scheduled for construction on U. S. 99.

The major gap in freeway and expressway construction on U. S. 101 between San Francisco and Los Angeles has been in southern Monterey County. The new budget provides for three projects, totaling 14.8 mi., which will close much of this gap be-

tween King City and the completed freeway south of Salinas. On the Redwood Highway (U. S. 101) in Humboldt County, the first unit of the freeway bypassing the State Park Redwood Groves is included.

The long-range effort to multi-lane U. S. 40 over the Sierra is continued in the new budget, with one 5.7-mi. freeway project in the high country west of Soda Springs and two projects for major detour construction preparatory to future freeway work on the same route.

Of several major bridge projects in the budget, one will be a new Colorado River bridge at Blythe, in co-operation with Arizona.



LAMINATED TIMBER BEAMS 94½ FT. LONG FOR FIELDHOUSE

Some of the largest glulam timber members ever made were placed recently in the Noe Fieldhouse in San Francisco for the Department of Parks and Recreation. The beams are 94 ft., 5½ in. long. They are connected by a hinge to the top of a concrete pilastered wall, with 20 ft. overhanging. The cantilevered sections are tied down through 2½-in. rods to a continuous 6 x 10-ft. concrete deadman. Since the vertical tie-rods are so important structurally they are covered by steel sleeves to protect them against moisture and vandalism.

One crane handled the beams, lifting them at the center of gravity. The biggest problem for the contractor was the tricky formwork on the bearing walls and the close control needed when setting the anchor bolts.

James I. Barnes Co. holds the \$429,000 general contract and expects to finish the project in February 1957. Architect is Donald Beach Kirby. Beams were fabricated by Timber Structures, Inc.

J. H. Pomeroy dies at 71

JOHN H. C. POMEROY, 71, founder of the general contracting firm of J. H. Pomeroy & Co., Inc., of San Francisco and Los Angeles, died Oct. 26 of a heart attack. Pomeroy founded his own firm in 1928 and has been identified with the heavy construction-engineering industry in the West for the past 40 yr. His company played an important role in the construction of three world-famous bridges: San Francisco-Oakland Bay Bridge, Golden Gate Bridge, and the Lake Washington pontoon bridge in Seattle. Among the more recent projects handled by the firm in the Bay area were the steel mill for Columbia-Geneva Division of U. S. Steel at Pittsburg, the Ford plant in Milpitas and a plant for American Can Co. in San Francisco. At the time of his death Pomeroy was chairman of the board of the Pomeroy firm. His sons Robert and William are president and executive vice president respectively.

ASCE creates Pipeline Division

IN RECOGNITION of the extensive development of the pipeline industry and the wide activity of many of its members in that field, the American Society of Civil Engineers has announced the creation of the Pipeline Division. This fourteenth division of the Society now is a going concern following formal inauguration ceremonies at the Society's national convention in Pittsburgh, Oct. 17.

The Division's Executive Committee has been announced as follows: Eldon V. Hunt, Calgary, chief engineer, Alberta Gas Trunk Line Co., chairman; Arthur E. Poole, Island Park, N. Y., president, Mallen Construction Co., vice chairman; Joseph B. Spangler, Houston, Transcontinental Gas Pipeline Co., secretary; Fred C. Culpepper, Jr., Alliance, Ohio, project manager, Ford, Bacon & Davis Construction Co., and Stanton E. Huey, Monroe, La., consulting engineer.

In announcing the Division's plans, the chairman said: "Many civil engineers are in the pipeline industry, which cuts across most phases of engineering represented by the Society. The Division is in the organization in which we 'pipeliners' can, most effectively, coordinate our work and technical progress with other fields of engineering. The division's purpose is to advance and correlate scientific knowledge and promote and coordinate economic development and construction of engineering projects in connection with the transmission of liquids, gases or solids by means of engineering in the fields of surveying and line location, design, construction and operations, and to promote tion and operations.



lead. Then study your crawler
cycles, but not just on the basis of
the biggest load in the shortest dis-
tance. Measure in *time* rather than
distance. Measure load-time, carry-
time, return-time. Find out the per-
centage of time you lose in moving
from one assignment to the next.

you measure production on your
crappers, your shovels, your pavers,
your drills. It is also important for
you to carefully study the one major
factor you've taken for granted... your
tractor. To be sure, yardage measure-
ments are impossible on most of their

production... but you can definitely
time your tractor moves and cycles
over a substantial period to your
ultimate advantage.

We'll be glad to help you set up
these studies if you wish. We suggest
you select the time and the place you
want it done. Then, when you know
just what you are now getting in
tractor performance, we'll be glad to
show your time-study man similar
operations on Tournatractor. We be-
lieve these preliminary studies on the
improved, present-day Tournatractor
will justify your measuring its out-

Diagonal line shows growth in backlog of con-
struction from \$30 billion in 1945 to \$105 bil-
lion in 1956, not including new long-range
Federal Aid Program which will finance in-
creased highway construction for 13 years at
an average of approximately \$4 billion per year.

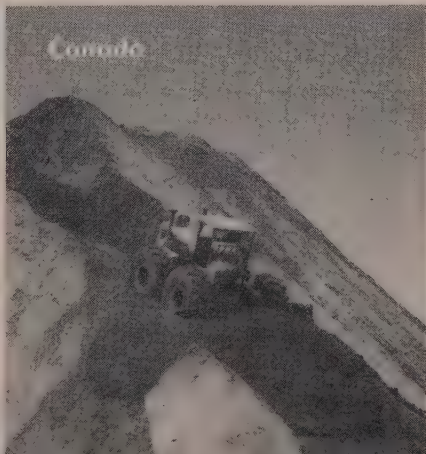
SwitchTractor, illustrated above, is Tournatractor with RR coupling attachment for combination of all types of regular tractor applications, plus RR switching service anywhere and anytime you need it. SwitchTractor straddles rails, gives more traction tires to ties than switch engine's steel wheels to steel rails.

standing advantages in speed and
mobility on one of your current jobs.
But don't take our word for it...
check for yourself.

SwitchTractor—Trademark, Tournatractor—Trademark Reg. U.S. Pat. Off. T-1127-G



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company



Hawaii Report

By SYD LOVE
Honolulu, Hawaii

THE MID-PACIFIC SUN that lulls the Territory of Hawaii's many races and helps create the casual, relaxed atmosphere of the seven islands did not have the same effect on the construction industry in 1956. It is a record year!

Construction on Oahu, where 82% of the Territory's personal income is earned, will total \$122,000,000, compared to \$94,000,000 during 1955, according to the General Contractors Association of Hawaii. Construction will net the islands \$100,000,000, compared to \$70,000,000 by tourism, the more colorful industry.

Housing—Military officials say nearly \$100,000,000 worth of housing for servicemen and families is planned on Oahu for the next two years. The Federal Housing Authority is in the process of closing bids on 1,326 units of Schofield Barracks housing. Theodore Meyer and Son of San Francisco and Nordic Construction, Limited, of Honolulu combined to bid low at \$21,500,000. Construction is scheduled to start in mid-December.

The Army wants 250 other units but will still be 2,000 units short. The Air Force has 600 planned at Hickam Air Force Base, but has not called for bids. The Navy is drawing plans but has not called for bids on 2,792 units, which still would leave it 6,400 short, according to Navy officials. All building would be under the Capehart Housing Program.

Home building for civilians is lagging behind the 1955 record pace, but is expected to reach almost the \$33,956,290 total for last year. The City-County of Honolulu completed four units of Kalihi Improvement District homes for \$1,000,000, paying for 50% of the cost, the owners paying for the other.

Highways—Extensive progress was made during 1956 on construction of two highway tunnel routes through the Koolau Mountain range on Oahu. One was the Nuuanu Pali Highway, a Territorial Highway Department project. J. M. Tanaka was constructing two tunnels and connecting bridge construction under a \$2,077,530 contract, largest ever granted by the Territorial Highway Department. The tunnels will carry two lanes of one-way (Honolulu-bound) traffic from windward to leeward Oahu. Eventually the Nuuanu Pali highway route will have a parallel tunnel route for Kailua-bound traffic. The Nuuanu route, now partially completed, will extend 8.2 mi. from Bishop and Beretania in downtown Honolulu to Castle Ranch

Office Junction on windward Oahu.

By 1961 the Territorial Highway Department expects to finish an \$80,000,000 stepped-up highway construction program, financed in part by a \$50,000,000 bond issue which Congress approved this year.

One of the highways to be finished under this program will be the \$40,000,000 Lunalilo Freeway. It will extend 7.5 mi. through urban Honolulu. About 1½ mi. has been completed.

Airports—Late in October work was started on a jet-age airport at the site of Honolulu International Airport, which is used by commercial, private and military planes. The present airport is designed with its runways as a part of Hickam Air Force Base. The new one will be, too. First work was clearing of old Navy barracks on the opposite side of the airport, where a new terminal building will be constructed. Total cost has not been estimated and terminal construction estimates jumped each time the master plan was modified for presentation to the Hawaii Aeronautics Commission, governing body for the Territory's 13 airports.

The latest unofficial guess was

nearly \$17,000,000 with \$6,000,000 tabbed for a terminal. Randolph M. Lee, who resigned as H. A. C. director effective November 1, said the next call for bids will be mid-December for \$550,000 of fill material for the terminal site. Ground preparation will start in February. Terminal construction is expected to start in November 1957, with completion slated for the end of summer, 1959.

Harbors—A \$7,000,000 revamping program for Honolulu Harbor was announced late in the year. J. O. Yapp, manager of the Territorial Board of Harbor Commissioners, said he probably will submit a plan to the 1957 legislature for financing by revenue bonds. The Territory is planning a terminal and shed for sugar and other products at Kawaihae, expected to cost \$1,000,000. But the big work there would be a \$6,000,000 dredging job for Kawaihae Harbor by the U. S. Army Corps of Engineers. Robert Palmer, chief of the civil works branch for the Corps in the Honolulu area, said it will be the biggest one-stage harbor development in the islands. Three million yards of coral and sand will be dredged in the three-year project. The entrance channel will be 2,900 ft. long and 40 ft. deep. The 3,200-ft. breakwater will require 200,000 tons of rock.

Low bids and contract awards

ARIZONA

Strong Co., Springville, Utah, received a \$1,156,244 award for construction of the Colorado River Storage Proj. Glen Canyon Unit, Ariz. and Utah. **Givens Construction Co.** of Phoenix submitted a low bid of \$248,887 for widening the existing roadway, grading and surfacing the Show-Springerville-East Highway in Apache County. A \$284,850 contract was received by **Tanner Bros. Contracting Co.**, Phoenix, for grading and surfacing the Nogales-Lowell Highway in Santa Cruz County. **Arizona Sand & Rock Co.** of Phoenix submitted a low bid of \$197,371 for 2 mi. of grading, draining and surfacing in Maricopa County. A \$185,794 contract was received by **Wallace & Wallace** of Phoenix for 6½ mi. of grading and surfacing Route 77 in Gila County. **Palmer Contracting Co.**, Phoenix, submitted a low bid of \$88,991 for 1.6 mi. of grading and surfacing the Picacho-Florence Jct. Highway in Pinal County. **Mountain States Construction Co.**, Denver, Colo., submitted a low bid of \$2,452,340 for Glen Canyon Dam, Right Diversion Tunnel, Middle River Div., Glen Canyon Unit, Ariz. and Utah Colorado River Storage Proj. **Western Constructors, Inc.**, of Phoenix received a contract of \$244,607 for

grading, surfacing and construction of two overpass structures and other work in Tucson, Pima County. A \$210,971 contract was received by **Fisher Contracting Co.** of Phoenix for grading and surfacing the Phoenix-Globe Highway in Gila County. **Peter Kiewit Sons' Co.**, Phoenix, submitted a low bid of \$84,561 for grading and surfacing south of Sedona in Yavapai County.

CALIFORNIA

Madonna Construction Co., San Luis Obispo, submitted a low bid of \$3,346,749 for grading, paving and construction of five bridges in San Luis Obispo County. **L. C. Smith** of San Mateo received a \$1,317,165 contract for grading and paving 4.2 mi. of the over-water section of the Bayshore Freeway in San Francisco and San Mateo counties. A \$1,039,677 contract was received by **Dan Caputo Co.**, San Jose, for 1.1 mi. of grading and surfacing and construction of two bridges in Fresno, Fresno County. **Mercer, Fraser Co., Inc.**, and **Mercer, Fraser Gas Co., Inc.**, of Eureka received two awards for roadwork in Mendocino and Humboldt counties: \$569,724 for repairing storm damage at 33 locations on U. S. 101 in Mendocino and Humboldt counties and \$392,052 for grading, surfacing and repair of existing em-

Low Cost Loading

**WITH NO SACRIFICE OF
STRENGTH OR CAPACITY**



KOLMAN MODEL 202 CONVEYOR

40' x 24" belt Model 202 conveyor
with 6' x 36" screen.

Rugged Box-Type Construction Permits Amazing Low Price

Here's the answer to low cost materials handling. Prices of the new KOLMAN Model 202 conveyor are so low you'll be amazed—yet the design and operating features are the very finest.

The Model 202 meets the demand for a conveyor in the low price field stout enough to carry a large single or double-deck vibrating screen and loading trap in a completely portable conveyor-screen plant.

'Box-Type' Construction

The rugged "box-type" construction of the Model 202 conveyor gives it unusual strength and rigidity. The sides are fabricated of 3/16" steel plate formed into a channel 16" deep with 2" legs. The steel belt cover reaches completely across the top, completing the box and completely encasing the return

belt to prevent materials from working in to cause belt damage.

The under-slung power unit provides easy access for servicing and operation from the ground. This is an ideal feature for the operator who has to stop and start his plant frequently during the day. The V-belt drive assembly assures positive and efficient transmission of power and the motor mount design provides for quick and easy adjustments to maintain proper belt tension through a turn-buckle arrangement.

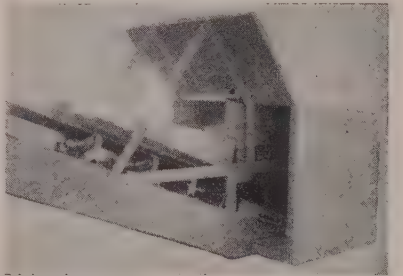
Folding Feature

The 202 is available with the Head Pulley Clutch feature which allows the belt to be stopped and started while the vibrating screen remains in operation. All plants with screens attached also have the folding feature, which permits the screens to be folded back under the conveyor when towing without removing any of the mounting or drive assemblies.

The KOLMAN Model 202 is rugged enough to carry a loading trap and large vibrating screen without additional support. It will take the kind of punishment that is dished out to a portable outfit—and will cost you far less money to own and operate. Available in 18" or 24" belt widths, in lengths up to 50'.



Rugged construction of Model 202 permits use of double-deck KOLMAN screens to make several sizes of material at once.



Portable feeder-trap combination available as integral part of conveyor. Gives positive constant flow of material.

SEE YOUR NEAREST DEALER

ARIZONA
PHOENIX—Equipment Sales Co., 720 S. 19th Ave.

CALIFORNIA
FRESNO—Allied Equipment Co., 1824 Santa Clara
LOS ANGELES—Brown-Bevis Industrial Equip. Co.,
6550 E. Washington
MARYSVILLE—Valley Truck & Tractor Co., 100 D St.
OAKLAND—Spears-Wells Machinery Co.,
1832 West 9th St.

SACRAMENTO—Sacramento Valley Tractor Co.,
Broadway & 19th St.

COLORADO
DENVER—Faris-Moritz Equipment Co.,
5790 Colorado Blvd.

IDAHO
BOISE—The Sawtooth Company, 1115 Grove St.

MONTANA
BUTTE—Hall-Perry Machinery Co., 812 E. Iron St.

GREAT FALLS—Hall-Perry Machinery Co.,
1116 15th St. North

BILLINGS—Hall-Perry Machinery Co.,
902 Central Ave.

MISSOULA—Hall-Perry Machinery Co.,
127 East Main St.

NEVADA
ELKO—A-D Machinery Co., 251 W. Commercial St.

NEW MEXICO
ALBUQUERQUE—J. D. Coggins Company,
1717 Second St., N.W.

FARMINGTON—J. D. Coggins Company,
3100 Block Main Street

OREGON
PORTLAND—Contractors Equipment Corporation,
2727 SE Union Ave.

UTAH
SALT LAKE—Rasmussen Equipment & Supply Co.,
1960 S. 2nd West

WASHINGTON
SEATTLE—Air-Mac, Inc., 3838 4th Ave. South

WYOMING
CHEYENNE—Worham Machinery Co.,
517 West 17th St.

CASPER—Worham Machinery Co., 1150 E. "B" St.
ROCK SPRINGS—Worham Machinery Co.,
"E" Street & Rennie

SHERIDAN—Worham Machinery Co., 1815 N. Main

ALASKA
FAIRBANKS, ANCHORAGE—The Carrington Co.

Western Representative

S. A. MADRID

1729 32nd Ave., San Francisco 22

KOLMAN MANUFACTURING CO.

5670 W. 12th St., Sioux Falls, S. D.

bankments, bank protection and installation of drainage facilities in Humboldt County. **Baun Construction Co., Inc.**, of Fresno received a \$204,859 contract for grading and surfacing 5 mi. of Rte. 1229 in Kern County. **Stewart & Nuss, Inc.**, Fresno, submitted a low bid of \$203,388 for 3.4 mi. of grading and surfacing south of Dos Palos in Fresno County. A low bid of \$153,818 was submitted by **Harms Bros.** of Sacramento for grading and surfacing 1.7 mi. of truck turnout lanes in Eldorado County. **Granite Construction Co.**, Watsonville, submitted a low bid of \$124,944 for construction of a bridge and approaches across Soquel Creek in Santa Cruz County, and \$392,851 for repairing storm damaged highways in Trinity and Humboldt counties. **Fredrickson & Watson Construction Co.**, Oakland, submitted a low bid of \$873,081 for grading, surfacing and construction of five bridges in Santa Clara County.

COLORADO

Monaghan & Smith Construction Co. of Derby submitted a low bid of \$439,278 for 7.3 mi. of concrete pavement north of Adams City, Denver County. A low bid of \$351,267 was submitted by **Pioneer Construction Co.**, Pueblo, for grading, structures and asphalt surfacing between Cedar-edge and Eckert in Delta County. **Smith & Lucas**, Colorado Springs, submitted a low bid of \$575,555 for grading, structures and surfacing South Limits Denver, southeast toward Castle Rock, Denver, Arapahoe and Douglas counties. **Gardner Construction Co.** of Glenwood Springs submitted a low bid of \$104,044 for construction of bridges across Plum Creek and the South Platte River in Douglas and Jefferson counties. **C. L. Hubner Co.**, Denver, submitted a low bid of \$174,052 for 5 mi. of grading, structures and surfacing north of Burlington in Yuma County. A low bid of \$122,723 was submitted by **L. J. Hesser** of Greeley for widening the railroad overpass south of La Salle on State Highway 3 in Weld County. **Henry Shore Co.** of Littleton submitted a low bid of \$204,507 for grading, structures and surfacing in Pueblo County.

IDAHO

Duffy Reed Construction Co. of Twin Falls received a \$997,597 contract for 8.4 mi. of grading, surfacing and providing maintenance stockpile in Power County. **Aslett Construction Co.** of Twin Falls received a \$203,980 contract for grading and surfacing 7.3 mi. of State Highway No. 79, from Newman's Corner west and south in Jerome County. **Quinn Bros. & Robbins, Inc.**, Boise, submitted a low bid of \$114,489 for extension of "C" line canal pumping plant, Payette Div., Boise Project. A

\$93,827 contract was received by **Pickett & Nelson**, Idaho Falls, for grading and surfacing in Bonneville County. **J. H. Wise and Son, Inc.**, of Boise, received a \$2,643,000 contract for the construction additions and modifications to the Assembly and Maintenance Building at the Aircraft Nuclear Propulsion area of the U. S. Atomic Energy Commission's National Reactor Testing Station. **Fred H. Slate Co.** and **E. C. Hall Co.** of Portland, Oregon, submitted a low bid of \$2,731,683 for constructing four lanes of U. S. Highway 10 in Kootenai County. **Miller & Strong** of Eugene, Oregon, submitted a low bid of \$378,487 for 3.2 mi. of grading and surfacing and construction of a bridge across Squaw Creek on the Lewis & Clark Highway, Lolo National Forest in Idaho County. **MacGregor Triangle Co.**, Boise, submitted a low bid of \$711,695 on the Clearwater River Road, Forest Development in Clearwater County.

MONTANA

Peter Kiewit Sons' Co., Butte, received a \$723,340 contract for grading and gravel surfacing the Gallatin-Gateway-South Road in Park, Wyoming and Gallatin counties. **Union Construction Co., Inc.**, of Missoula submitted two low bids for road work in Granite County: \$215,634 for 3.5 mi. of grading and gravel surfacing the Philipsburg-Anaconda highway and \$237,817 for grading and graveling 4.1 mi. of the Philipsburg-South Highway. A \$923,480 contract was received by **Riedesel Construction Co.** and **Schye & Sullivan** of Billings for construction of a bridge over Yellowstone River on the Yellowstone River Br.-Glendive in Dawson County. **Robertson & Cave, Inc.**, Great Falls, received a \$400,238 contract for 7 mi. of grading and gravel surfacing in Judith Basin County. **G. E. Marshall** of Roundup received a \$340,384 award for 10.4 mi. of grading and surfacing the Glasgow-Opheim-Canadian Line Highway in Valley County. **Wm. W. Strever**, Billings, received a \$224,945 contract for maintenance stockpiles in Big Horn, Carbon, Yellowstone, Stillwater and Sweetgrass counties.

NEVADA

Dodge Construction, Inc., of Fallon received a \$599,475 contract for construction of a portion of the highway system north of Beatty in Nye County. A contract for \$101,867 was awarded to **Nevada Contractor's, Inc.**, of Reno for construction of a concrete bridge across the east fork of the Carson River, south of Gardnerville in Douglas County. **Isbell Construction Co.**, Reno, received a \$2,467,263 contract for construction of a portion of the highway system in Douglas and Ormsby counties. **Morrison-Knudsen Co., Inc.**, Salt

Lake City, Utah, received a \$419,784 award for grading and surfacing on U. S. Route 40 near the Nevada-California State Line, Washoe County. **Wells-Stewart Construction Co., Inc.**, of Las Vegas received a \$411,397 contract for construction of a portion of State Highway on Route 6, Nye County.

NEW MEXICO

Wylie Brothers Contracting Co. of Albuquerque received a \$1,476,211 contract for 9.8 mi. of grading and surfacing U. S. 66, east of Clines Corners-East in Torrance County. **Henry Tygeson & Co.** of Albuquerque received two contracts for road work and structures in Eddy and San Juan counties: \$589,623 for construction of a bridge, City of Carlsbad Road in Eddy County and \$235,589 for 21.9 mi. of grading and surfacing the Shiprock-West Road in San Juan County. A \$619,321 contract was received by **Jack Adams** of Santa Fe for 3.2 mi. of grading and surfacing the City of Carlsbad Road in Eddy County. **Wayne A. Lowdermilk, Inc.**, Santa Fe, received a \$416,313 contract for 5.5 mi. of grading, surfacing and structures on the Costilla-Amalia Road in Taos County. A \$134,109 contract was received by **Longenbaugh & Co., Inc.**, of Albuquerque for 9.7 mi. of grading and surfacing the Loving-Jal Road in Eddy County. **Richey Construction Co.**, St. Johns, Ariz., submitted a low bid of \$156,354 for earthwork, clearing and structures for irrigation rehabilitation Belen Unit 1, Middle Rio Grande. **Haake Construction Co.** of Santa Fe received two contracts for road work in Harding and San Miguel counties: \$97,830 contract for 6.5 mi. of grading and surfacing the Roy-West Road in Harding County and \$90,188 for 1 mi. of grading and surfacing in San Miguel County.

OREGON

Lee Hoffman, general contractor of Beaverton submitted a low bid of \$108,348 for main canal structures, Medford and Rogue River Valley Project, Rogue River Basin Project. **Warren Northwest, Inc.**, Portland, received a \$307,977 contract for 11.9 mi. of grading and paving the East Unit, Fork Rock Road, southeast of Bend in Deschutes County. **C. R. O'Neal**, Creswell, was awarded two contracts for roadwork in Douglas County: a \$196,200 contract for 1.2 mi. of grading and paving the Fords Bridge Unit, Myrtle Creek-Canyonville section of the Pacific Highway and \$697,708 for the Fords Bridge-Canyonville Section of the Pacific Hwy. north of Canyonville. **Rogers Construction, Inc.**, of Portland received a \$1,050,740 contract for 3 mi. of grading and surfacing Emigrant Hill-Deadmans Pass Section of the Old Oregon Trail Highway about 15

mi. southeast of Pendleton in Umatilla County. A \$102,689 contract was received by **Morgan Bros.**, Coquille, for 3.1 mi. of grading and surfacing Parish Creek Unit, Spray-Waterman Section of the Spray-Waterman County Road in Wheeler County. **Workman & Wilson** of Canby received a \$139,862 contract for the Whiteson Section of the Pacific Highway West, 4 mi. south of McMinnville, Yamhill County. **Lee Hoffman**, Beaverton, received a \$719,642 award for structures on the Myrtle Creek-Canyonville Section of the relocated Pacific Highway in Douglas County. A \$273,523 contract was received by **Durbin Bros.**, Eugene, for 2.2 mi. of grading and paving the East and West Forks Illinois River Bridge Section of the Redwood Highway in Josephine County. **Roy L. Houck & Sons**, Salem, received a \$573,220 award for 2.3 mi. of grading and paving the Illahee-North Jefferson Junction Section of the Pacific Highway in Marion County.

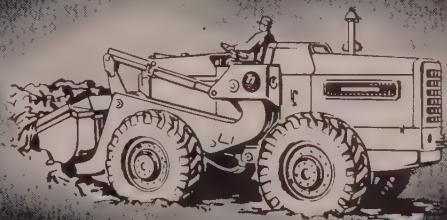
UTAH

Morrison-Knudsen Co., Inc., of Salt Lake City received a \$208,378 contract for 6.2 mi. of grading and surfacing the West-Escalante-Henrieville highway. **L. A. Young Construction Co.** and **Vernal Sand & Gravel Co.** of Richfield received two contracts for roadwork and structures in Sanpete and San Juan counties: \$185,255 for grading and surfacing Main Street in Monticello, San Juan County and \$178,319 for grading and surfacing in Sanpete County. **L. A. Young Construction Co.**, Richfield, received a \$75,494 contract for construction of two bridges in Garfield County. **Wheelwright Construction Co.** of Ogden submitted a low bid of \$293,938 for 13.6 mi. of grading and structure in Box Elder County.

WASHINGTON

Northwest Construction Co., Seattle, received a \$708,233 contract for construction of the Capitol Lake Bridge in Thurston County. A \$305,116 contract was received by **Cherf Bros. & Sandkay**, Ephrata, for construction of Okanogan River bridge, Okanogan County. **John E. Alexander** of Seattle received a \$151,664 contract for the Weyerhaeuser Railway Undercrossing in Thurston County. **C. & E. Construction Co., Inc.**, Yakima, received a \$192,627 award for 1.4 mi. of grading and surfacing in the cities of Ephrata and Soap Lake, Grant County. A \$282,724 contract was received by **Troy T. Burnham Co.**, Seattle, for N. P. Ry and Percival Creek overcrossing in Thurston County. **C. E. O Neal** of Ellensburg received a \$283,321 contract for 6 mi. of grading and surfacing, Janis to Tonasket, Okanogan County. A \$96,656 contract was awarded to **J. J.**

POWER BY HERCULES...!

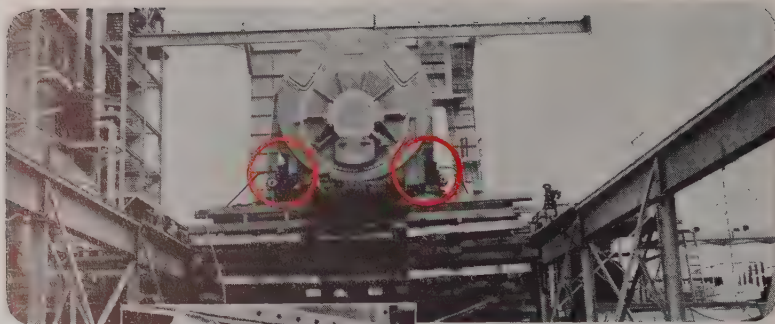


"PAYLOADER" Tractor Shovels rely on . . . power by Hercules. These popular tractor-shovels require lightweight, high-speed, heavy-duty engines. That's why Hercules Gasoline and Diesel Engines were selected for many of the "PAYLOADER" models.

Hercules on-the-job engines are tailored to the specific power needs of all types of equipment in the following industries: transportation, agriculture, construction, mining, industrial, logging, oil field and marine.

For "top-notch" performance, insist on . . . power by Hercules in your equipment.

HERCULES MOTORS CORP. • CANTON, OHIO



Duff-Norton air jacks

Raise Big Loads—and Profits

By ingenious use of Duff-Norton air jacks, a Dallas contractor finds that he lowers costs, speeds work, gets greater dependability and safety with these portable tools on difficult installations of big equipment.

Using two 100-ton capacity Duff-Norton jacks, the mechanical contractor, E. E. Farrow Company, raised a 240,000 lb. turbo-generator 22 ft. at the plant of the Western Farmers Electric Co-operative. Three men completed the job in 2½ days with a jacking-blocking procedure which resulted in a savings of \$400.

Duff-Norton air motor jacks were also used to raise a 210-ton, 100,000-kw generator 13 ft. at the Dallas Power & Light Company, Parkdale Station. These same jacks helped cut costs of similar jobs at Haskell, Lone Star, Corpus Christi and Riesel, Texas.

Duff-Norton air motor jacks have a lift of 14 to 30 inches and are mounted on rubber-tired, roller bearing wheels for easy positioning by one man. They operate on 80 to 100 lb. air pressure.

The six Duff-Norton models range in capacity from 20 to 100 tons—weigh from 238 to 530 pounds. A sturdy base prevents tipping or settling. Safe operation is assured by an automatic shut-off which stops motor when safe limit is reached. Keyway in ram prevents the head from turning and shifting load. Lowering and lifting speed is controlled by air motor. Jacks will not creep or drop the load.

For data on these cost reducing jacks and name of nearest distributor write Duff-Norton Co., P.O. Box 1889, Pittsburgh 30, Pa. Ask for bulletin AD-11-A.

DUFF-NORTON

Giving Industry A
Lift Since 1883

Jacks

Branch Office: 1016 Howard Street, San Francisco, Calif.

Welcome Construction Co. of Redmond for 1.8 mi. of grading and surfacing in the Riverside vicinity, Okanogan County. **Fegles Construction Co., Inc.**, Minneapolis, Minn., submitted a low bid of \$2,336,000 for altering an existing control shaft and construction of a second power plant at Fort Peck. **Woodworth & Co., Inc.**, of Tacoma submitted a low bid of \$1,639,758 for reconstructing and widening 3.5 mi. of P. S. H. No. 1 from Nisqually to North Fort Lewis. **Bocek Bros.**, Hoquiam, received a \$557,392 contract for 5.5 mi. of grading and surfacing the Airport Road to North River in Pacific County. A \$311,235 contract was received by **S. S. Mullen, Inc.**, Seattle, for 3 mi. of grading, surfacing and structures on Factoria Interchange East in King County. **Natt McDougall Co.**, Portland, Ore., received a \$277,890 contract for 2.3 mi. of grading and surfacing from Dodge to Kuhl Ridge Road in Garfield County.

WYOMING

Northwestern Engineering Co. of Denver, Colo., received a \$507,551 award for grading, surfacing and misc. work on 10.1 mi. of the Ft. Laramie Lingle Road in Goshen County. **Jones-Hinckley & Jones, Inc.**, of Powell received a \$218,377 contract for grading, special embankment and misc. work on 7.5 mi. of the Medicine-Bow North Road in Carbon County. A \$268,222 contract was received by **Schmidt Construction, Inc.**, of Arvada, Colo., for the construction of pioneer tunnel bore in Shoshone Canyon west of Cody, Cody-Yellowstone Park road in Park County. **Gerald M. Ryan**, Worland, received a \$68,021 contract for grading, draining and misc. work on 4 mi. of the Spring Creek road in Carbon County. **Platte Valley Construction Co.**, Grand Island, Neb., received two awards for road work in Laramie and Goshen counties: \$681,479 for grading, surfacing and pipe arch culvert installations on 10.1 mi. of the Wheatland-Cheyenne road in Laramie County and \$184,517 for grading, surfacing and construction of concrete slab spans over Horse Creek, on 3 mi. of the Huntley-Lyman, Nebraska Road in Goshen County. **Risler & McMurry** of Casper received a \$670,732 contract for grading, surfacing and construction of a bridge on 5.5 mi. of the Kemmerer-Sage Junction Road in Lincoln County. A \$171,534 contract was received by **Asbell Bros. Construction Co.**, Riverton, for grading, draining, surfacing and misc. work on 7.3 mi. of the Riverview Road in Fremont County.

ALASKA

Pacific Alaska Contractors, Inc., Tacoma, Wash., received a \$490,190 award for constructing 1.7 mi. of the Cooper River Highway in Alaska.

PG&E contract let for underground powerhouse

A CONTRACT for the excavation of 6½ mi. of tunnel and the first large underground powerhouse in the United States, the Haas Powerhouse in the North Fork of the Kings River, Fresno County, Calif., was awarded recently by Pacific Gas and Electric Co. Norman R. Sutherland, president and general manager of PG&E said the successful bidder was Morrison-Knudsen Co., Inc., Henry J. Kaiser Co., Macco Corporation, and B. Perini and Sons, Inc., a joint venture.

The power plant will be located in a solid rock chamber 500 ft. vertically below the surface and 2,000 ft. inside the mountain from the river in the rugged, granite canyon of the Kings. It will be the first underground powerhouse to be constructed in the United States since 1913, when PG&E built its Spaulding No. 1 Powerhouse, a much smaller plant, on the South Fork of the Yuba River. The only other underground plant in the United States is a small one at Snoqualmie Falls, Wash., built 1898.

The excavation for the Haas Powerhouse will be approximately 50 ft. wide, 170 ft. long and 100 ft. high, and will house machinery which will generate 128,000 kw. of electricity.

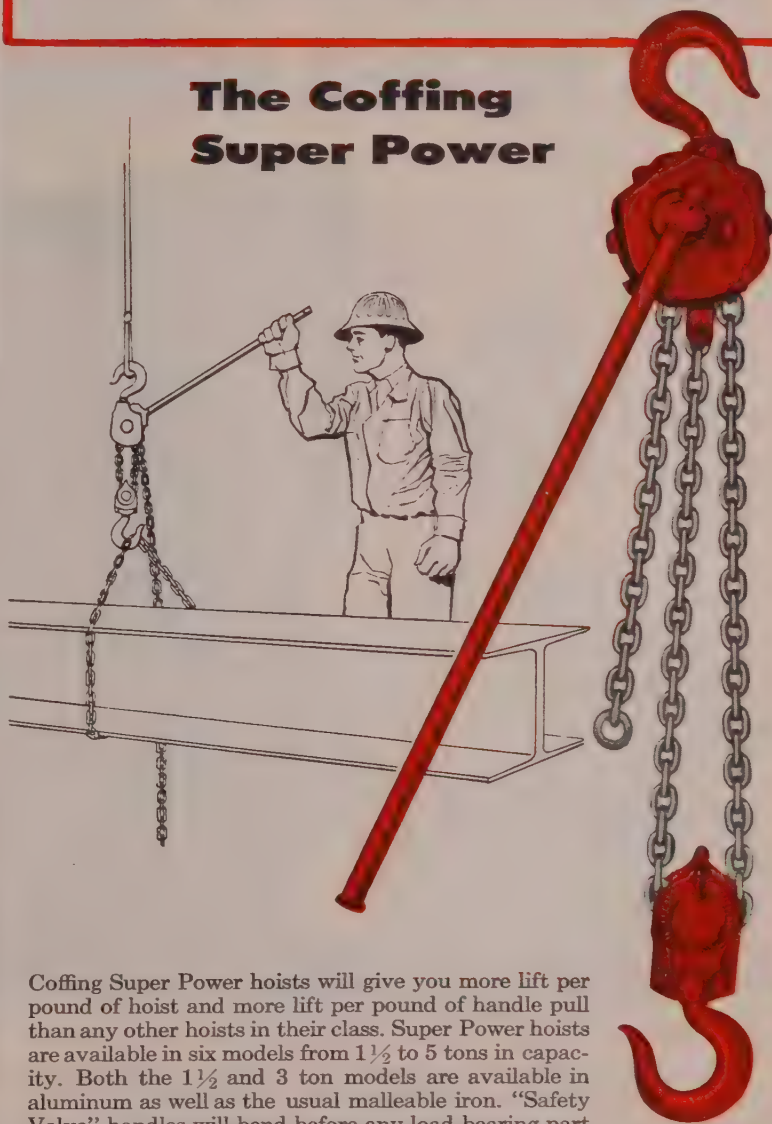
Water will be carried to the plant from Wishon Reservoir, now under construction, through a horseshoe-shaped pressure tunnel 32,800 ft. long and 13 ft. in diameter, and 4,500 ft. of heavy steel penstock pipe. The last 850 ft. of penstock will be encased in a steeply inclined tunnel connected to the powerhouse chamber. After driving the plant's two turbine-generators the water will be discharged into the existing Balch diversion reservoir on the river through 2,000 ft. of tailrace tunnel 15 ft. wide and 17.5 ft. high.

The tailrace tunnel will be paved for use as an access roadway to the plant during construction. A vertical shaft for access also will be driven from the underground chamber to the surface. This shaft will contain an elevator, stairway, ventilating duct and wiring for control of the machinery and transmission of the electricity.

The company's Kings River development, being built at a cost of \$80,000,000, includes construction of the Courtright and Wishon dams, enlargement of the existing Balch diversion dam, the driving of new tunnels totaling 10 mi. in length and construction of 2,000 ft. of tunnel siphon pipe, the installation of three penstock pipes totaling 2 mi. in length, the construction of the Haas and Kings River powerhouses and enlargement of the existing Balch Powerhouse. The development will add 261,500 kw. of generating capacity to the PG&E system.

**This hoist is the most efficient
lightest, safest hoist in its
capacity class available today!**

The Coffing Super Power



Coffing Super Power hoists will give you more lift per pound of hoist and more lift per pound of handle pull than any other hoists in their class. Super Power hoists are available in six models from 1½ to 5 tons in capacity. Both the 1½ and 3 ton models are available in aluminum as well as the usual malleable iron. "Safety Valve" handles will bend before any load-bearing part can fail, and all hoists are tested at 100% overload.

Weight and bulk have been saved through the use of patented compound levers, rather than the conventional gears. These levers also give the hoists an increased efficiency of 85%. The operating handles may be adjusted for length and operated from either side of the hoists, and they cannot spin out of control.

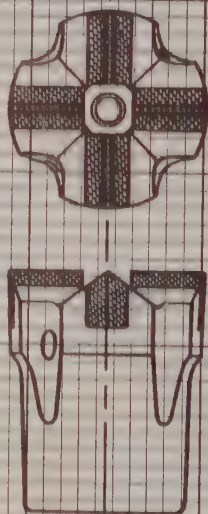
For complete details write for Bulletin SP, Coffing Hoist Division, Duff-Norton Company, 810 Walter Street, Danville, Ill.

COFFING HOIST

Division of Duff-Norton Company

Branch Office: 1016 Howard Street, San Francisco, Calif.

THIS ROCK BIT IS PRECISION-MADE FOR A HIGHER PERFORMANCE

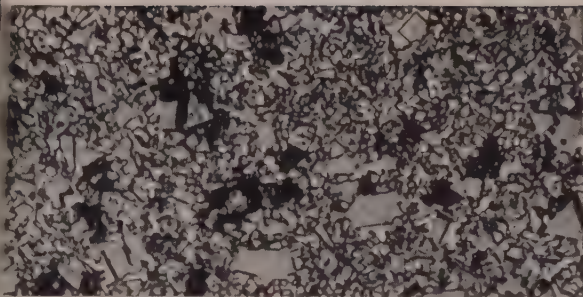


**Nothing tougher and more wear-resistant
than the insert of a Sandvik Coromant 776 bit**

Rock bits that go on *and on* must have highest-grade tungsten-carbide inserts. Nothing but tungsten carbide in its purest state is good enough, will last as long. That's why the carbide that goes into a Sandvik Coromant 776 bit is meticulously controlled.

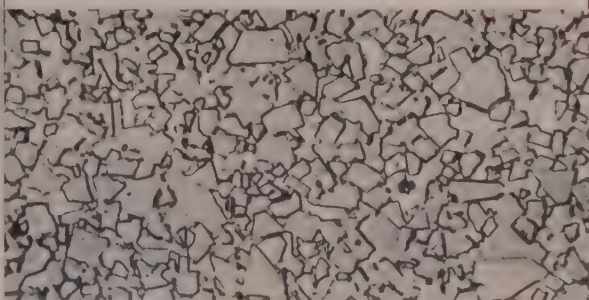
Sandvik, the world's largest manufacturers of tungsten-carbide inserts for rock drilling, control every phase of production. Coromant carbide is scrutinized for impurities from the very first stages

of processing the tungsten ore, right through to the final inserts. Add to that Sandvik's special process of securing the insert to the body, employing an exceptionally strong bonding metal, and you know why a Coromant 776 bit lasts longer. In 1955, one billion feet were drilled with these inserts, all fitted to Sandvik Coromant bits or integral steels. *Nothing is more conclusive of the quality of Coromant bits than this figure.*



LOW QUALITY TUNGSTEN CARBIDE

These are unretouched, 1200-times enlarged micro-photos. Above, carbide full of impurities. Those black marks are contaminations which are present when production and quality control are deficient. Contamination of this kind weakens the carbide and reduces its working life.



SANDVIK COROMANT TUNGSTEN CARBIDE

This is Coromant carbide. Notice the uniformity of size and the even distribution of grain. Coromant inserts are free of dangerous porosity and impurities—the reason they go further, have greater strength.

SANDVIK COROMANT 776 BITS

and Sandvik Coromant integral steels are available in standard sizes through Atlas Copco, who, in their own field, are the world's largest manufacturers of rock drills. Contact any of these offices *today* for further information and a demonstration.

Nothing stands the strain like the Swedish body of a Sandvik Coromant bit

When you put the strongest possible tungsten carbide into a rock bit, the body has to be the strongest available to take the extra strain. That's why Coromant bodies are made of high-quality Swedish alloy steel. But that's not all. Inserts and clearance are cylindrically-ground and the insert ends precision-tooled to exactly the same height. This means *smoother* drilling and *smoother* holes, because the load is equally distributed on all four inserts. *Precision engineering such as this give Coromant bits a longer life!*

Nothing fits like the precision-milled threads of a Sandvik Coromant bit

In order to get a smooth profile of the highest accuracy, Coromant threads are precision-milled in a special thread-milling machine and not made with a tap. Precision-milling too protects the skirt from common fatigue failures.



U.S., Atlas Copco Pacific, Inc., 930 Brittan Avenue, San Carlos, California. Atlas Copco Eastern Inc., P.O. Box 2568, Paterson 25, N.J.

CANADA, Atlas Copco Canada Ltd., Montreal, Airport, P.Q.

MEXICO, Atlas Copco Mexicana S.A., Apartado Postal 56, Torreon, Coahuila.

Atlas Copco

Manufacturers of Stationary and Portable Compressors, Rock-Drilling Equipment, Loaders, Pneumatic Tools and Paint-Spraying Equipment

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

CY SQUEEZE—Howling, icy winds; snow, blizzards and the long darkness of Alaskan winter have slowed most Alaska construction in its annual deep freeze. Hazards of trying to continue construction in the Far North despite winter conditions can hardly be realized by the Alechako (the statesider who has paid only a brief visit to Alaska). One construction man, a labor foreman on a defense construction site in the Arctic, told me how a rescue party had to be sent out for a catfisherman who was marooned in a howling blizzard less than a mile from camp. His cat stalled out on him, trapping him in the sub-zero cold and blowing snow. As he had been told to do, he crawled into his Arctic sleeping bag and awaited rescue, which came in about three hours. "You don't fool around in weather like that," was the construction man's comment. Alaska can be merciless to the uninitiated construction man. So, unless the job is absolutely vital, it shuts down for the winter season.

WHITE ALICE WORK—Winter weather is curtailing the tempo of White Alice communications work in Alaska. Because of the severity of the weather, including heavy snow and record cold, there were large-scale layoffs on White Alice and other projects. Plane reservations from Anchorage to the states were reported heavy—and the bulk of the traffic was in one direction—southward. The weather throws a monkey wrench into Alaskan construction work in more ways than one. It makes hauling of equipment to sites difficult. It causes unpleasantness to personnel who must work in it. And it raises hob with construction equipment and machinery. On many construction projects, however, the weather has not had so pronounced an effect on progress of the work. These are the projects where much of the outside construction has been completed and inside utilities and carpentry have been left for winter construction. On more than a score of Alaskan construction projects, inside work on buildings being erected is proceeding unhampered by the icy gusts.

UNEMPLOYMENT—The winter brings unemployment to many Alaskans. In the Anchorage area alone, 6,699 persons have registered as unemployed, according to John F. Isadore, manager of the office. Of these, 93 registered during the last two

weeks in October, reflecting the heavier volume of winter-time layoffs occurring in the construction industry. Unemployment hit hardest in the ranks of laborers, truck drivers, heavy duty operators, heavy duty mechanics, carpenters and general office clerks. Unions in the Anchorage area reported that their lists of unemployed were growing—an annual occurrence around this time of the year. Only a few openings, comparatively, have been reported by employment officials, and these in a specialized, hard-to-fill category. Throughout the year there has been a demand for engineers, electronic specialists and female clerical help of a highly skilled variety.

WHITE ALICE A SUCCESS—Alaska's White Alice project is a success. The communications system which links Air Force stations in Alaska with each other and with other stations across the North American continent, received its initial test late in October. The words "Boy, doesn't it sound good?" echoed down 1,500 miles of electronic corridors in Alaska in the test. They were the first words spoken over a completed segment of the Alaskan system on which construction was started in 1955 after a year of preliminary surveys. The words were spoken by William E. Burke, vice president of Western Electric in charge of the defense projects division. White Alice communications have the voice-carrying qualities of long-distance calls. The system comprises both micro-wave transmission known as Forward Propagation Tropospheric Scatter.

ROADS IN ALASKA—Discussion of road construction goals and problems in Alaska dominated the recent meeting in Seward of the All-Alaska Chamber of Commerce. Present for the discussion were delegates from virtually every major city in Alaska and such highway officials as M. M. Flint, Bureau of Public Roads district chief in Alaska and Brig. Cmdr. S. L. Mueser of the Northwest Highway System in Canada. Road officials made these things clear at the meeting: 1. The Copper River highway linking the town of Cordova with the main Alaska road system would be given high priority in future Alaska highway planning. 2. Every effort would be made to keep Thompson pass on the Richardson highway to Valdez open on a year-around basis. Intense interest of

Alaska in road construction stems from realization that development of the Territory will be accelerated by improvements in transportation.

WILDERNESS SKYSCRAPER—One of the world's unique construction projects—a 14-story skyscraper in the icy Alaskan wilderness—has been turned over to the Army by the Patti-MacDonald construction company—or at least was scheduled to be turned over when this was written. The giant structure—an apartment house—is being built at the Army's port of Whittier, 60 airline miles southeast of Anchorage. The building will be used to house 177 families of military men who will administer the Army's port. The 14-story building features one, two and three-bedroom apartments, lounges, play rooms, four elevators, closed-circuit TV and latest functional design. Almost a stone's throw away from the wilderness skyscraper is a 3,500-foot glacier-capped mountain. Skyscraper was built because of lack of level ground in the mountainous area.

CONSTRUCTION NEWS NUGGETS—In one week recently building permits in Anchorage reached a total of \$348,745 . . . Rear Admiral Fondville Lee Tedder, USN (Ret.) has been appointed Alaska manager for Distant Early Warning Line work . . . Horace M. Furr, site selector for Western Electric, was treed by a bear recently while in the Alaska wilderness. After 45 minutes, the bear went away . . . Expenditures totalling \$2,765,000 for the next fiscal year have been approved for the Alaska Railroad . . . The District Engineer office in Alaska employs more than 50 physically handicapped persons . . . M. B. Contracting Co., Inc., of Seattle has been honored by the District Engineer for outstanding performance of an Alaska construction contract . . . Winter conditions have necessitated closing of the Steese, Taylor and Elliott highways in Alaska . . . The Bureau of Reclamation has issued a report of its studies on a potential dam site at Devil Canyon on the Susitna River . . . Roads, buildings and airfields for the Distant Early Warning network will be about 95 per cent completed by the end of the year, but technical equipment installation will take several months longer . . . An enlarged safety council—responsible for safety policy, regulation, inspections and compliance—has been appointed by the Alaska District Corps of Engineers . . . Cost of living surveys are being made in five Alaska cities by the Alaska Resources Development Board. The five towns selected are Juneau, Anchorage, Fairbanks, Ketchikan and Sitka . . . Nine projects are included in the \$4,968,000 appropriation for Alaska Public Works program in 1957.

New **POWER-TURN** Steering

gives you tighter turns with two-track power

Look at that turn! That's what a tight turn looks like with *full power on both tracks*. It means 100% working power at all times, even on the sharpest turns. It means added work capacity. It's **POWER-TURN** steering—another exclusive Oliver development.



POWER-TURN

OLIVER OC-12



...More push for your profits, too!

With 53 drawbar h.p., the OC-12 is one of the most powerful tractors of its class. Now **POWER-TURN** makes it pay still bigger dividends. You sweep through turns of *any* radius with full load. Or hold a straight line in angle dozing with the heaviest off-center loads.

Yet **POWER-TURN** is actually simpler. Two inter-connected systems of control provide planetary reduction gears on each track. Here is the maximum in efficient flow of power, 100% tractive

turns, better maneuvering. Operation is easier, too, with finger-tip controls to take all the muscle out of it.

In addition to **POWER-TURN**, the new OC-12 offers new over-center hand clutch and foot brake for greater operator convenience. Why not sit at the controls yourself and see the difference? Your Oliver distributor will gladly demonstrate. Call him today.

THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois



A COMPLETE LINE OF INDUSTRIAL WHEEL AND CRAWLER TRACTORS AND MATCHED ALLIED EQUIPMENT

ENGINEERS on the move



THREE SAFETY AWARDS for defense construction in Alaska during 1955 were won by the Alaska District, Corps of Engineers; by Whittier Residency, C. of E.; and Grove Shepherd Wilson & Kruege Construction Co., of Seattle. L. to r.: **Hampton J. Roberts**, G-S-W-K representative; **Henry Hedburg**, Anchorage Central Labor Council; **Larry Moore**, Associated General Contractors; **Col. Pierre V. Kieffer, Jr.**, Alaska District Engineer, who made the presentation for the North Pacific Division; and **Lou Henke**, Whittier resident engineer. The safety record at Whittier actually was made under **Carl Eilerton**, formerly resident engineer there.

Paul L. Nichols has entered the employ of the Hawaiian Dredging Co., Ltd., of Honolulu, T. H., where he is chief engineer on Contract NBY5822. Nichols was chief engineer for the Sonoma County Flood Control and Water Conservation District with headquarters at Santa Rosa, Calif., before accepting his present position.

* * *

Charles H. Carter and **Palmer B. DeLong** have been appointed assistant regional directors for Region 4, Bureau of Reclamation, as announced by **E. O. Larson**, Regional Director, Salt Lake City, Utah. These appointments are part of increased staffing required to handle the expanded program in Region 4. Construction is in progress on the Eden, Provo River, and Weber Basin projects and has started on Glen Canyon and Flaming Gorge dams, initial key structures in the Colorado River storage project.

Carter has been regional engineer since 1946 and has also served as acting assistant regional director during the past two and a half years. Since 1950 DeLong, as head of the Rock Springs office, has supervised construction of the Eden Project in Wyoming, in addition to his project planning activities.

Richard E. Lauterbach, manager of manufacturing for General Petroleum Co., has been elected president of the Engineers Club of Los Angeles. Other officers elected with him are **Robert F. Stewart**, vice president; **Eugene R. Johnson**, secretary; **Wallace W. Kenney**, treasurer. **Al Farley** continues as manager of the Club's headquarters in the Biltmore Hotel.

* * *

Joseph M. Kane, assistant office engineer of the Division of Highways headquarters office in Sacramento, Calif., has retired after 29 years with the State. Kane has been responsible for the production of the Division's "Standard Specifications" which set up the standards governing execution of all California highway construction work. These standards are nationally recognized, and have served as a model for other state and federal agencies.

* * *

Phillip J. Daniel, partner in the architectural and engineering firm of Daniel, Mann, Johnson and Mendenhall, recently announced the consolidation of their five Los Angeles area offices under one roof. Located in the new Tishman Building, 3325 Wilshire Blvd., the engineers have two floors.

Harold N. Walker with 24 years of Federal service has retired from the Portland District, Corps of Engineers. He was a former design branch chief and recently a member of the United Nations Technical Advisory Board at New Delhi, India.

* * *

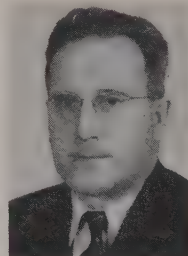
Bert Lund, maintenance engineer for District 10 office of the California State Division of Highways in Stockton, retired after 28 years in State service. His successor is **Everett R. Thomas** who was materials engineer for the district.

* * *

William A. Barbeau, industrial consultant, has joined the staff of **L. W. Davidson and Associates**, architects and engineers of Los Angeles.

* * *

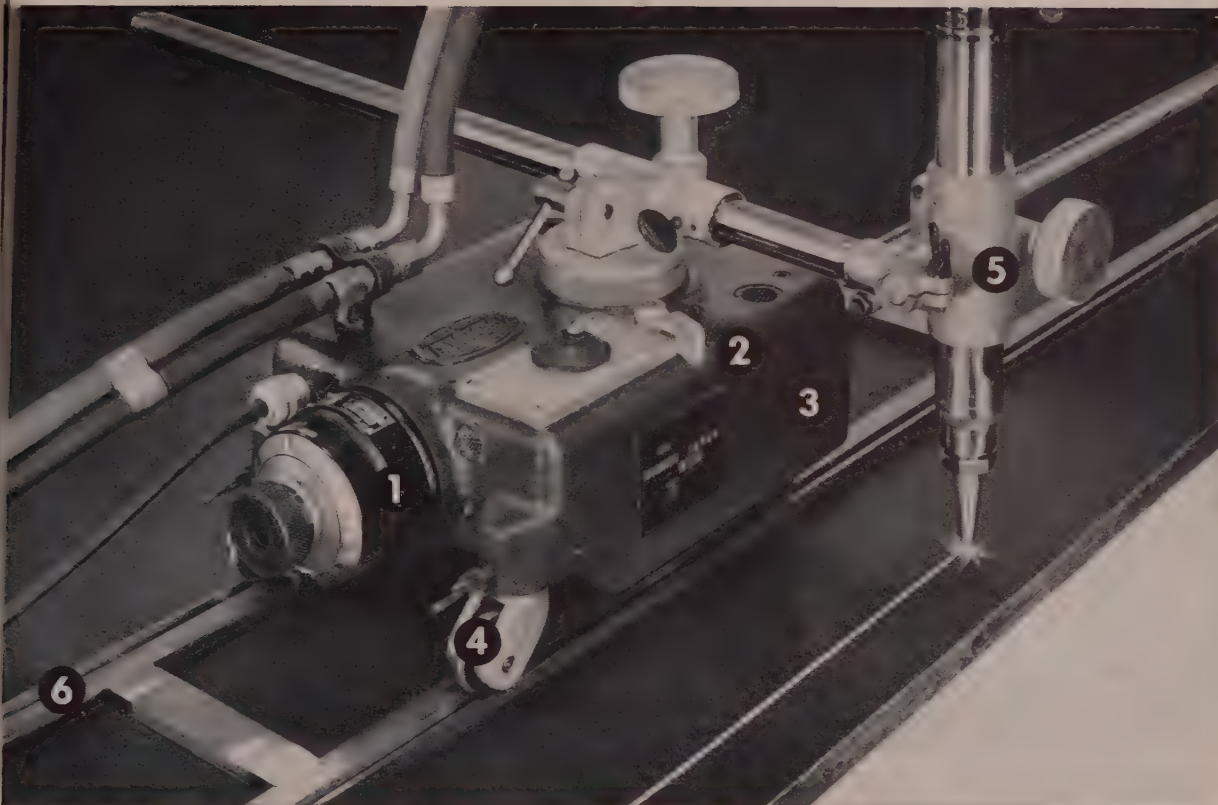
Raymond Archibald, division engineer, Division 7, Bureau of Public Roads, San Francisco, resigned Oct. 11 to become an associate in the firm of **J. E. Greiner Co.**, consulting engineers, Baltimore, Md. For the next four months he will be on a special assignment for that firm, after which he will go to Seattle to open an office for them to serve the Northwest area. Archibald, a graduate of Oregon State College in 1919, held various bridge engineer positions in the highway departments of Oregon, Missouri, Arkansas, and Idaho, prior to his appointment with the BPR in 1935, when he was placed in charge



Raymond Archibald

of bridges on the Inter-American Highway in Central America. He resigned in 1938 to work for **J. E. Greiner Co.** and returned to BPR in 1941 for assignment in the bridge division of the Washington office. In 1944 he had charge of bridges on the Alaska Highway, and in the fall of that year he was made chief of the bridge division (Washington office).

April 1948-1949 he took leave from the Bureau to again work for the Greiner Co. in charge of the design of the Chesapeake Bay Bridge, after which he resumed his position of chief, bridge division. Jan. 1, 1952, he was transferred to San Francisco to assume the duties of chief, Western headquarters, which position he held until abolishment of that office and title in July 1953, when he was appointed division engineer, Division 7.



Quality in Details! these factors make the Airco #10 Radiograph your best buy

The #10 Radiograph is a portable (43 lb) gas cutting machine designed to cut metals up to 6" thickness. It will cut straight lines of any length, circles from 3" to 85" diameter, arcs up to a radius of 42½" — all with square or beveled edges. Designed to provide the greatest degree of cutting accuracy and convenience of operation, the husky overall construction of the #10 has made it an indispensable tool wherever steel is to be cut to size for fabrication. Here are a few of the *quality details* that don't meet the eye:

1. Governor Control Variable Speed Motor puts the entire speed range (4 to 50 ipm) at operator's fingertips. An indicator showing all speed settings is provided. Speed can be increased or decreased while cutting is in progress... speed is not affected by load or voltage changes.

2. Clutch Lever allows the machine to be rolled freely in either direction. This feature is a time-saver when aligning the machine with work.

3. Drive Shaft (under housing) runs on replaceable needle bearings which reduce friction to a minimum and affords a maximum of free motion.

4. Caster Wheels run in a machined groove in track for greater machine stability and more accurate cutting.

5. Torch Holder Assembly is made of brass forgings which withstand more abuse than castings and have greater corrosion resistance than iron or steel.

6. Track is cold rolled steel with two machined grooves in which wheels travel, and has track sections with tongue and grooved joints for correct alignment when multiple lengths are used for progressive cutting.

Airco oxyacetylene shape cutting machines include the Airco Camograph, Monograph, Duograph, Oxygraph and Travograph. Write today for literature.



AIR REDUCTION PACIFIC COMPANY

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

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

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

SUPERVISING the jobs

Key men on Salt Lake Fill



VISITING THE JOB SITE are, left to right: **H. W. Morrison**, president of M-K, **L. D. Wilbur**, vice president, and **O'Dean Anderson**, project manager.



ON THE JOB for Southern Pacific Co. are, left to right: **Lee Marsden**, chief inspector, and **H. J. Willard**, division construction engineer.



HEADING UP the M-K supervisory staff are, left to right, **R. K. Woodhead**, office manager, **Denny Bagley**, project engineer, and **Carl Larson**, general superintendent.

RIGHT, fill constructors, l. to r. (front row) **David Duncan**, general carpenter foreman, **J. O. McGinnis**, general foreman, **Bill Anderson**, asst. general superintendent, **George Borman**, excavation foreman, **Elmer Riggan**, master mechanic; (back row) **Richard Bingham**, night superintendent, **P. A. Corkins**, conveyor-erection superintendent, **Max Ware**, excavation foreman, **Frank Currey**, marine superintendent, **John Deagon**, asst. master mechanic, and **Charles Kinlaw**, truck foreman. Nearly 700 men are on the job.

(See article beginning on page 25)



Brad Lockwood is general superintendent on Peter Kiewit Sons' Co.'s \$2,711,100 award for 3.5 mi. of grading, surfacing and construction of two bridges in Marin County, Calif. Project engineer on the work, which started in May and is scheduled for completion next August, is **Ed Bilsborough**. Other key men are **Ed Burton**, structure superintendent, **Jack Tribolet**, office manager, **John Kaufman**, grading superintendent, and **Pete Crawford**, master mechanic.

* * *

Arthur Ingwerson, project manager, and **P. D. "Pat" Patterson**, job superintendent, head the list of construction men grading and paving hangar aprons at Ladd AFB, Alaska, a \$1,702,652 contract being handled by Morrison-Knudsen Co., Inc. Job started in mid-August and is expected to run until next September.

* * *

Fred Swanson is project superintendent on another of Morrison-Knudsen's contracts in Alaska. This is for construction of Communication "White Alice" facilities at King Salmon Air Base. Going since August, the work will probably be finished by the end of December.

* * *

R. A. Millard, superintendent, with the assistance of **Joe M. Houston**, foreman, is supervising a recent award to J. F. England's Sons, Inc., for 6 mi. of grading and surfacing and small drainage structures on the Fairview-Girard-west highway in Richland County, Mont. This \$219,770 project got started in October and will probably end next June.

* * *

H. Hudgens is superintending the construction of a concrete girder bridge across the Swift River in Trinity County, Calif., for G. S. Herrington, contractor doing the work at a cost of \$104,920. Carpenter foreman is **John Kennedy**. Just started in November, the work will extend to July next year.

* * *

George Hays, manager, and **Ted Spencer** and **Don Wilkerson**, superintendents, head **Bernard M. Wilkerson's** construction crew erecting classroom buildings and dormitories

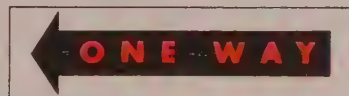


One of the area's pioneer construction firms, Warren Northwest, Inc., of Portland has built literally thousands of miles of highway since its founding in 1905.

Most recent job completed by Warren Northwest was the Willamette River—Crosby Road section of the R. H. Baldock Freeway, during which time the company laid blacktop paving at the rate of 200 tons per hour.

Like scores of other West Coast construction firms, Warren Northwest relies upon General Petroleum products and service to keep its equipment operating at top efficiency. President Jack R. Wininger says, "We've dealt with G.P. on construction jobs all over the Northwest...we're convinced their products and lube engineering service have contributed to better maintenance and fewer breakdowns."

Supt. Reg Jenkins, a veteran of 38 years with Warren Northwest



Pres. Jack R. Wininger



2-1054



and additional mechanical facilities at the California School for the Deaf, Riverside. This work, which was awarded to Wilkerson on a low bid of \$916,443, is expected to be complete next February.

* * *

J. D. Naillon, chief engineer, and W. C. Rowley, project engineer, are key men for Herrick Iron Works which is constructing a 1-story structural steel frame fabrication plant near Mount Eden, Calif. Started in November, the plant is expected to be finished about July next year.

* * *

A. L. Acton, superintendent, Ged Monighan, timekeeper, F. R. Acton

and Gail George, shift bosses, are top men on 6.3 mi. of grading, graveling, and oiling of the Red Lodge-Columbus highway in Carbon County, Mont. This \$327,131 contract got under way in September and will probably end next summer.

* * *

Ted Willis, project manager, and Orville Thorson, superintendent, head the list on Crown Construction Co.'s project covering precast concrete tilt-up construction of high school classrooms, shop and multi-purpose facilities at Azusa, Calif., for the Union High School District. A year-long construction, Crown received the award at \$944,514, and ex-

pects to have the project complete about September next year.

* * *

C. H. Murphree, area superintendent for Stolte, Inc., is in over-all charge of construction of six concrete and masonry structures, utilities, etc. at the Army Terminal, Oakland, Calif. Project superintendent is C. H. Hansen, Jr. Stan Kister is surveyor on this \$739,891 job which got under way in October, with November next year set as the finishing date.

* * *

W. Kent Slate is superintending a \$393,265 award to Fred H. Slate Co. for 3.5 mi. of grading and surfacing in connection with widening of an existing roadway in Cascade County, Mont. Foreman on this job, which started in September with finishing date marked for July 1957, is John Dever.

* * *

Norman F. "Norm" Barber has been appointed by R. J. Daum Construction Co. as superintendent for two school projects to be constructed at Calexico, Calif., on \$1,049,566 and \$145,769 contracts awarded to Daum. Barber recently finished a project at Bell Gardens, Calif., built for Langendorf Bakeries, which included what is said to be the world's largest prestressed concrete roof.

* * *

R. J. Scalzo of Thomas Scalzo Co. is directing his company's \$154,895 contract for extension of 4-lane highway from Tumwater towards Shelton and Harbor Wye in Thurston County, Wash. Other key assistants on the 2.2 mi. of grading and surfacing are H. Hienbigner, clearing foreman, P. Raghianti, grading superintendent, and B. Curtin, master mechanic.

* * *

Reid W. Erickson is project manager for Erickson Paving Co. on 3.2 mi. of grading, surfacing and constructing three bridge structures, Renton to May Creek in King County, Wash. Grading superintendent on this \$826,545 project is Lloyd Brooker, and Ted Moore is shop foreman. The work started in September and will probably be finished by next August.

* * *

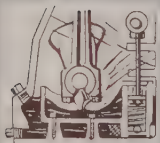
J. A. Sheldon, general superintendent, and P. J. Moore, job superintendent, are top men for Harms Brothers on construction of 1.7 mi. of truck turn-out lanes west of Kyburz and east of Echo Summit, Eldorado County, Calif. Work is expected to be finished by Dec. 20. Contract price was \$153,818.

* * *

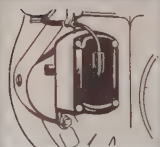
Charlie C. Lewis, superintendent, is finishing up on a \$239,380 contract of Jack Adams, General Contractor, covering 5.8 mi. of grading, drainage structures, one bridge and miscellaneous construction 9 mi. north of Moses in Union County, N. Mex. J.



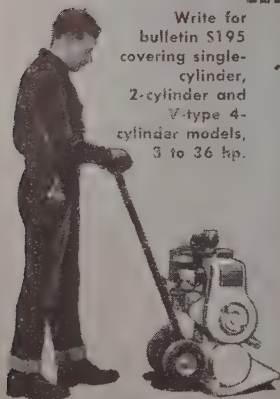
**THE HIGHEST-QUALITY TAPERED
ROLLER BEARINGS AT BOTH ENDS
OF CRANKSHAFT, PREVENTING
BEARING FAILURE . . .**



**A POSITIVE LUBRICATION SYSTEM
THAT NEEDS LESS WATCHING . . .**



**PLUS AN EXCLUSIVE OUTSIDE,
WEATHER-SEALED MAGNETO . . .**



Write for
bulletin S195
covering single-
cylinder,
2-cylinder and
V-type 4-
cylinder models,
3 to 36 hp.

... all are reasons why a
WISCONSIN ENGINE

**is specified by Jay Corporation,
Columbus, Ohio, for the Jay Tamper.**

The engine powering a tamper must absorb shock after shock, yet continuously deliver peak performance, month after month. Because it more than meets these qualifications, the Model ACN 5½ hp. Wisconsin Engine powers the Jay Tamper.



WISCONSIN MOTOR CORPORATION

MILWAUKEE 46, WISCONSIN

World's largest builder of heavy-duty air-cooled engines

A 6-6012-1/2-1A

PROOF OF



QUALITY



Versatile, truck mounted LIMA 44 crane speeds freeway construction for Grove, Shepherd, Wilson & Kruge of California, Inc.

This 25-ton Lima Type 44 truck crane is helping to construct the West Coast's largest double deck freeway, at Oakland, California. Owner Grove, Shepherd, Wilson & Kruge of California, Inc., uses it for a variety of heavy duty lifting jobs . . . transferring concrete from truck mixers to hoppers on the bridge deck (shown above); lifting heavy forms, steel and other materials. They report:

"This rugged Lima is tops for the tough assignments that call for a sturdy, dependable machine that stays on the job. It gives us fast, smooth, precise lifts every time. Downtime is no problem, so operating costs are low."

The Lima Type 44's truck mounting pays extra dividends, too. Traveling under its own power, at automotive speeds, the machine gets from job to job *fast*. On the job, the Lima's oscillating tandem type rear axles make it highly mobile off the highway, too . . . and they make for firm working footing on uneven terrain. Grove, Shepherd, Wilson & Kruge concludes: "The Type 44's fast travel speed and mobility let us use it to serve widely separated jobs quickly and economically."

You, too, can rely on Lima's quality design and construction to insure top service on *your* jobs. These ruggedly built, fast-working machines guarantee you top output at lowest operating cost. Quality pays . . . and Lima quality *pays off*

for you! Find out about it from your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

DISTRIBUTORS—Our Seattle Office, 1932 First Avenue South, Seattle 4, Washington; **Feenaughty Machinery Co.**, 112 S.E. Belmont Street, Portland 14, Oregon; **Feenaughty Machinery Co.**, 600 Front Street, Boise, Idaho; **Smith Booth Usher Company**, 2001 Santa Fe Avenue, Los Angeles 54, California; **Modern Machinery Co.**, 4412 Trent Avenue, Spokane 19, Washington; **Acme Iron Works**, 540 Culebra Avenue, San Antonio, Texas; **Cascade Industrial Supply**, 4560 Highway 99 South, Redding, California; **Shriver Machinery Company**, 1756 Grand Avenue, Phoenix, Arizona; **N. C. Ribble Co.**, 1304 North Fourth Street, Albuquerque, New Mexico; **Bay Cities Equipment, Inc.**, 2792 Cypress Street, Oakland 7, California; **Bay Cities Equipment, Inc.**, 1178 West San Carlos Street, San Jose, California; **Faris-Moritz Equipment Company**, 1095 South Jason Street, Denver, Colorado; **McGaraghan Supply Company**, 529 Broadway, Eureka, California; **Heiner Equipment & Supply Co.**, 501 West 7th, South, Salt Lake City, Utah; **Hall-Perry Machinery Company**, 902 Central Avenue, Billings, Montana; **Hall-Perry Machinery Company**, 812 East Iron Street, Butte, Montana; **Hall-Perry Machinery Company**, 1116 15th Street North, Great Falls, Montana; **Hall-Perry Machinery Company**, 127 East Main Street, Missoula, Montana; **Evans Engine & Equipment Company**, 4300 11th Avenue, Northwest, Seattle 7, Washington; **Reno Equipment Sales Company**, 1700 West Street, Reno, Nevada.



LIMA SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

BALDWIN - LIMA - HAMILTON

Construction Equipment Division — LIMA WORKS

OTHER DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

H. Ryan & Son is doing the bridge work.

* * *

E. J. "Ed" Hixson (right) is general superintendent, and C. S. "Red" Baker (left) is job superintendent for A. J. Diani Construction Co. which



started work in October on a \$179,-895 award for grading and surfacing 3.6 mi. of new road south of Santa Maria, Santa Barbara County, Calif. Engineer here is Jack McGregor. Purchasing agent is Fred Hamann. Job will probably end in February.

* * *

W. B. "Red" Rogers, superintendent, Harold Muzatko, job engineer, and Hoyt Yeager, are key men for Lewis Hopkins Co., Inc., which received a recent award from the Bureau of Reclamation on a low bid of

\$309,976 for pumping plants at the Columbia Basin Project in Washington. Work started in September and Hopkins expects to finish the job by November next year.

* * *

A. J. Parker, general superintendent, Steven Pryor, project superintendent, and James Mann, project engineer, are top men on an award to Mountain States Construction Co. for expanding utility system, at Fort Carson, Colo., a \$457,643 project which got under way in July and is now in the finishing stage.

* * *

William C. Burns, project superintendent for Vinson Construction Co., is in charge of work on the \$2,-143,907 contract being executed by Vinson on the Solano Project, Calif. Known as the Putah South Canal, job consists of 12.6 mi. of 10-ft. bottom canal, with structures and drainage channels. Fred Scales is canal lining superintendent. Scheduled for completion next August, the job got under way in October.

* * *

William E. Cowan is general superintendent for W. H. Darrough & Sons, while Bob Darrough is superintendent on a recent award to the company for 3.3 mi. of grading and paving at various locations on the Lakeville Road, south of Petaluma, Sonoma County, Calif. Grade foreman on the \$238,996 job, now completing, is George Williams.

Adair Rippy as general superintendent is in overall charge of a \$289,509 contract recently awarded E. J. Rippy & Sons for grading, structures and surfacing 5.1 mi. on the summit of Lizard Head Pass, over 10,000 ft. high in Dolores and San Miguel counties, Colo. Superintending the work, which involves 296,000 cu. yd. of excavation, and 31,-700 tons of subbase, is W. R. Brown. The office is in charge of Kenneth Horne. Jim Gant is labor foreman, and L. E. Savoie, mechanic.

* * *

Cecil Adamson, concrete superintendent, and Harold Carpenter, excavation superintendent, are key supervisors for Quinn Bros. & Robbins who recently received a contract on a low bid of \$114,499 for extension of "C" line canal pumping plant in the Payette Division of the Boise Project, Idaho. Work started in mid-October and will end about June.

* * *

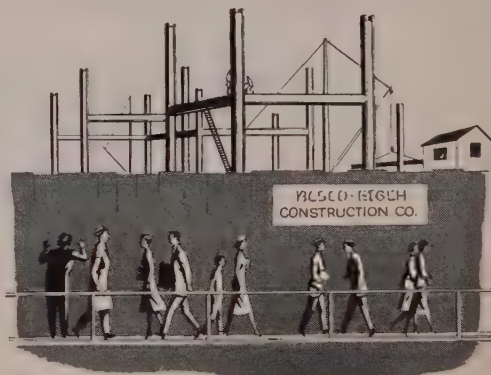
Warren Gardner and Harold Wilson, project manager and superintendent respectively, head the crew of Gardner Construction Co. on grading, structures and asphalt surfacing of 1.1 mi. of highway in Mesa County, Colo. Other important supervisors on this \$369,500 job are these foremen: Leon Harrington, carpenter; George Monks, labor, and Melvin Heatherly, grade. Under way since August, contractor expects to finish up in January.

For the protection of CONTRACTORS and OWNERS

BUILDERS RISK INSURANCE

(Fire and Extended Coverage)

National Surety's facilities have been broadened to include the issuance of this essential protection throughout construction. This coverage is available nationwide through a network of top independent insurance agents and brokers.



NATIONAL SURETY
CORPORATION



A MEMBER OF *Fireman's Fund* INSURANCE GROUP

Fireman's Fund Insurance Company • Fireman's Fund Indemnity Company
Home Fire & Marine Insurance Company • National Surety Corporation

401 CALIFORNIA STREET, SAN FRANCISCO • 4 ALBANY STREET, NEW YORK

Branch Offices in Principal Cities Throughout America

LORAIN 26

BIG

POWER CLUTCHES RESULTS



The Lorain-26 Hoe digs deeper in harder materials, has excellent stability to give greater digging ranges. All-welded, box-section, rugged boom is "goosenecked" for deep digging.



A Big, Heavy-Duty $\frac{3}{4}$ -Yd. Shovel-Crane

Here is a powerful and extra-husky $\frac{3}{4}$ -yd. shovel-crane that can take the constant punishment of hard, heavy-duty service. The Lorain-26 is big, heavy and sturdy. It has lots of power, plenty of clutch capacity and a long and wide crawler, providing excellent stability in the toughest digging. Also available as 15 or 17½-ton crane. Ask your Thew-Lorain Distributor for full information.

TURNTABLE FEATURES — "E-Z" controls — anti-friction bearing mounted • "Hydra-Ease," power, crawler controls • New, bigger 18" shoe clutches—fewer adjustments, longer life • Big, heavy-duty, truss-reinforced, rigid turntable bed • "No-shock, no-stall" hydraulic coupling available.

CRAWLER FEATURES—Wide, long, heavy crawlers • 2 travel speeds in both directions • Wide, 29" drop-forged

treads • Sealed idler rollers on anti-friction bearings available • Independent travel available, ideal for hoe and dragline service.

BOOM FEATURES—3 hoe dippers—30" to 40" • Longer, stronger 19' shovel and 19' hoe booms • Full manganese, heavy-duty shovel dipper • Independent cable crowd on shovel • Usable as shovel, crane, clamshell, dragline, hoe.

THE THEW SHOVEL CO., LORAIN, OHIO

Get "26" Facts
from your
**THEW
LORAIN**
DISTRIBUTOR

**ANDREWS EQUIPMENT SERVICE
OF WASHINGTON, INC.**

Spokane, Wash.

ATLAS EQUIPMENT COMPANY

Salt Lake City, Utah

CENTRAL MACHINERY CO.

Great Falls, Havre and Lewistown, Mont.

COAST EQUIPMENT CO.

San Francisco 3, California

A. H. COX & COMPANY

Seattle 4, Tacoma, Wash.

GENERAL EQUIPMENT CO.

Reno, Nevada

INTERSTATE TRACTOR & EQUIPMENT CO.

Portland and Eugene, Ore.

MCCOY COMPANY

Denver 17, Colo. Bc: Durango, Grand Junction, Pueblo & Sterling, Colo.

MOUNTAIN TRACTOR CO.

Minneapolis and Kalispell, Mont.

NASH-DAVIS MACHINERY CO.

Billings, Montana. Branches at Bozeman, Mont. and Greybull, Wyo.

LEE REDMAN EQUIPMENT CO.

Phoenix, Arizona

SANTA FE EQUIPMENT CO., INC.

Los Angeles and San Bernardino, Calif.

SOUTHERN IDAHO EQUIPMENT CO.

Idaho Falls. Boise and Twin Falls, Idaho

TRACTOR & EQUIPMENT CO.

Sidney, Mont. Branches: Miles City, Glasgow, Mont.

WORTHAM MACHINERY COMPANY

Cheyenne, Wyo. Branches: Casper, Sheridan and Rock Springs, Wyo.

YUKON EQUIPMENT INC. (for Alaska)

Seattle, Wash. Branches at Fairbanks and Anchorage, Alaska

WC16

NEW LITERATURE

For your convenience in obtaining free copies of literature described, the company address is provided with each review.

New catalogs from Symons

Two new catalogs describing in detail different lines of its forming equipment have been issued by the **Symons Clamp & Manufacturing Co.**, 4249 Diversey Ave., Chicago, Ill. One catalog shows the firm's line of Mag-ply forms and the other illustrates Symons Steel-ply forms. The catalogs contain on-the-job photos of each type of form along with helpful information on their advantages and how to assemble them. Also illustrated are various details of corner, pilaster and filler arrangements. Both catalogs describe the complete line of Symons hardware.

Drott literature

International Harvester Co. has just made available six new pieces of literature on International Drott Skid-Shovels and attachments. A 16-page, two-color general catalog covers the entire International Drott line, with on-the-job photos showing units utilizing various attachments, and diagrams illustrating the latest improvements. Other literature ready is an eight-page catalog describing the several sizes of log and pulpwood Skid-Grapples available, a four-page bulletin on grubber blades, and single-page specification sheets on the following: Bullangle dozer blades, rock forks, and scarifiers. Refer to the following numbers when ordering your copies: K-656 for the 16-page general catalog, A-100 for the eight-page Skid-Grapple catalog, A-200 for the grubber blade booklet, A-400 for the Bullangle dozer blade sheet, A-500 for the rock fork sheet, and A-300 for the scarifier sheet. **International Harvester Co.**, 180 North Michigan Ave., Chicago 1, Ill.

Pipe wrapping techniques

Techniques for protecting underground pipe from corrosion with Scotchrap band pipe insulation tape is the subject of a new how-to-do-it booklet announced by **Minnesota Mining & Manufacturing Co.**, Dept. D6-262, 900 Fauquier St., St. Paul, Minn. Called "Tape It Easy," the new 24-page booklet provides step-by-step photographs and instructions for wrapping bends, elbows and short sections, patching pipe with tape, preparing joint surfaces for wrapping, wrapping welded joints and taping straight pipe sections as well as street "T" fixtures and other typical fittings. A table on the book's back cover lists recommended tape width for various pipe sizes, outlining the minimum recommended tape overlap and the number of squares of tape needed

per 100 ft. of pipe using various overlaps.

American Hoist & Derrick catalog

A heavily illustrated, 24-page catalog presents the American line of 25-ton capacity truck cranes and self propelled cranes. Detailed information is given about the machinery, the machinery deck, the boom construction and attachments. Line drawings accompany instructions on how to strip the unit for highway travel. Full page job photographs complete the booklet. Write for catalog 700-G-26. **American Hoist & Derrick Co.**, 63 So. Robert St., St. Paul 1, Minn.

M-H-F introduces utility tractor line

A 24-page booklet prepared by **Massey-Harris-Ferguson, Inc.**, gives complete information on the new M-H-F line of industrial tractors specially developed for the construction industry. On-the-job photographs and illustrations of the machines' component parts accompany the text. Full details are given about the various applications, specifications, capacities and features of the units, which have a power range of 34 to 52 hp. Also included are specifications and capacities of the Davis front and rear attachments specially designed and built for the M-H-F Work Bulls by Mid-Western Industries, Inc. Copies of the handbook are available from **Massey-Harris-Ferguson, Inc.**, Industrial Division, Quality Ave., Racine, Wis.

Road stabilization manual

"The Sta-Bilt Road" is the title of a new comprehensive manual issued by **Seaman-Andwall Corp.**, manufacturers of the Seaman Pulvi-Mixer. The 22-page handbook explains in detail the operation of the Pulvi-Mixer in all types of road stabilization procedures. Technical consideration is given to the causes and remedies of pavement failure along with complete instruction on the proper use of the Seaman Mixer in processing clay-sand and bituminous mixtures, soil aggregates, turf surfaces, coarse aggregates, and soil cement. Photographs and cross-section diagrams illustrate the text. Copies available from **Seaman-Andwall Corp.**, 261 North 25th St., Milwaukee 1, Wis.

Be-Ge Speedhauls

Now available are specification sheets describing the Be-Ge Speedhauls for use with Wagner industrial wheel tractors and the Oliver Super 99 tractor. Illustrated with job photographs and line drawings and punched for easy notebook filing, the brochures offer complete data on dimensions, capacity ratings, weights and types of control for the Speedhaul models. **Be-Ge Manufacturing Co.**, P. O. Box B-1, Gilroy, Calif.

Allis-Chalmers snow equipment

"Do You Remember" is the title of a four-page brochure reviewing the use of Allis-Chalmers construction machinery for snow removal. Job photographs illustrate the use of the 45 motor grader, Model D motor grader and tractor shovels in keeping roads and streets clear. Information is also given about the Allis-Chalmers snow plow, snow loader, and power hydraulic sweeper attachments. **Allis-Chalmers Manufacturing Co.**, Construction Machinery Division, P. O. Box 512, Milwaukee 1, Wis.

New Galion catalog on T-600 grade-o-matic grader

An informative illustrated catalog on the Galion Model T-600 Grade-O-Matic grader is available from **The Galion Iron Works & Manufacturing Co.**, Galion, Ohio. Advantages of the torque converter drive and powershift transmission, which increase work production and simplify operation of this 140-hp., 30,240-lb. grader, are fully explained as well as other features of design and construction. Catalog No. 415 is available from Galion distributors or from the company.

Heil literature on hoists and truck bodies

New literature from the **Heil Co.** describes the Heil line of hydraulic hoists and truck bodies. Bulletin BH 54120 gives specification and construction details on the single and twin-cylinder twin-arm hoists and double-cylinder lightweight hoists, the lightweight telescopic hoists and conversion hoists. Features of the Heil truck bodies are outlined along with their specifications. Another illustrated brochure, No. BH 51103, offers further information of the Heil single-cylinder twin-arm hoists and includes close-up views of the unit. **The Heil Co.**, 3073 W. Montana St. Milwaukee 1, Wis.



NO HORIZONTAL JOINTS: 30" sq. steel form pans were set to full height in segments of 1/9 of wall. Omitting pans left pouring windows, easily closed when concrete level reached them. Preload Construction Corp., N. Y., contractor.

Construction Methods Photos



5 MEN ON ROLLING TRUSS removed form ties before prestressing operation.



WIRES WOUND 40 STRANDS PER FT. and, at the base, several layers deep, carry 105,000 psi working circumferential stress. Layers were grout bonded and sealed. Previously, vertical prestressing of 140,000 psi was done by wires placed before pouring.



CONTINUOUS POUR of 125' dia. foundations and floors (540 cu. yds. per tank) avoided joints.

17" thin concrete, prestressed both ways,

walls 5 million gallon tanks

TWO TANKS, each 125' in diameter with a liquid depth of 54', were built for Philadelphia Suburban Water Co., North Wayne, Pa., with an estimated saving of 800,000 lbs. of reinforcing steel. With both vertical and circumferential prestressing, instead of heavy reinforced construction, walls are only 17" thick, domed with 2 1/2" thick concrete air-placed around wire mesh.

The workable high strength concrete needed (a mix of 5 1/2" slump developing 5400 psi in 28 days) was processed and delivered on carefully set schedule by truck mixers of certified design, capacity, mixing speed and accuracy of water control.



You have a right to insist on this Rating Plate. It certifies compliance with the high industry standards maintained for your protection by the Truck Mixer Manufacturers Bureau.

BLAW-KNOX CONSTRUCTION EQUIPMENT DIV.
Mattoon, Ill.

CHAIN BELT COMPANY
Milwaukee, Wis.

CHALLENGE MANUFACTURING CO.
Los Angeles, Calif.

CONCRETE TRANSPORT MIXER CO.
St. Louis, Mo.

CONSTRUCTION MACHINERY CO.
Waterloo, Iowa

THE JAEGER MACHINE COMPANY
Columbus, Ohio

THE T. L. SMITH COMPANY
Milwaukee, Wis.

WILLARD CONCRETE MACHINERY CO., LTD.
Lynwood, Calif.

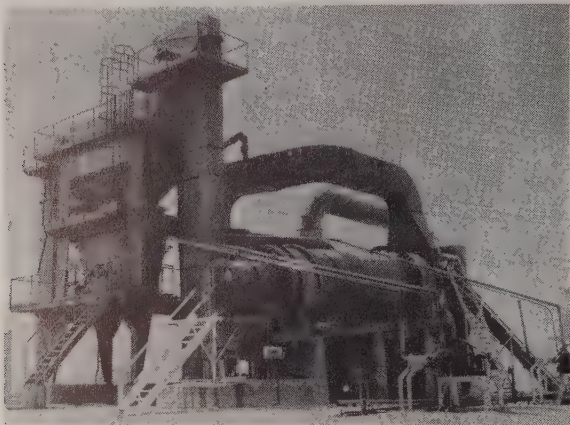
WORTHINGTON CORPORATION
Plainfield, N. J.

NEW EQUIPMENT

For your convenience in obtaining more information quickly, the manufacturer's address is provided with each review.

Standard Steel introduces Road-Master asphalt plants

Standard Steel Corp., Los Angeles, has recently announced its new line of Road-Master asphalt plants, built in capacities ranging from 4,000 to 6,000 lb., all semi-transportable. The new Road-Master 6,000-lb. capacity unit, Model R-M, has an 8-ft. diameter dryer, the highest



capacity dryer in its field. Reported tonnages with this plant are more than 240 tons per hour. The new Road-Master plants have such features as: oversized screen, dryer and elevator, dust seals on all units, and simplified push-button controls to reduce operator fatigue. Further information available from **Standard Steel Corp.**, 5001 South Boyle Ave., Los Angeles 58, Calif.

Ottawa Big Muscle backhoe available for Michigan 75-A tractor shovel

The Ottawa Big Muscle backhoe, with good ground clearance for easy operation and maneuverability over rough terrain, is now available for the Michigan 75-A tractor shovel. Both the Model DX-75A backhoe, which digs to a depth of 11 ft. and the model EX-75A backhoe



with an 8½-ft. digging depth, can be equipped with buckets from 12 to 36-in. width. Features of the Ottawa

backhoe include an automatic ejector bucket which positively ejects wet or sticky materials without loss of cycle time, and the Ottawa One-Trol which assures fast, smooth operation by use of only two levers to control all actions which normally require the use of multiple levers. Power is obtained from the Michigan hydraulic system. Manufactured by **Ottawa Steel Division of L. A. Young Spring & Wire Corp.**, Ottawa, Kan., this heavy-duty industrial type backhoe is available through Michigan tractor-shovel dealers.

New heavy-duty Hobbs platform trailer

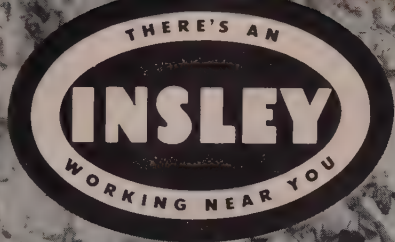
The new "light-heavyweight" of Hobbs' K-series platform trailers is this heavy-duty unit—rugged enough for handling concentrated loads off the highway, yet light enough for moving profitable legal payloads along the road. Produced by Hobbs Trailers in lengths from 33 to 41 ft., the new platform trailer has a rated capacity of



45,000 lb., but weighs only 10,849 lb. The unit's center frame is a 12-in. I-beam of high-tensile steel; cross members are stronger, closer together, and the center section is strengthened by eight knee-braces between the center-frame and the outer frame rail, four to a side. Features include a folding kingpin (for use with a two or three axle truck) and a two-speed landing gear. Designed for haulers of steel, concrete blocks and heavy machinery by **Hobbs Manufacturing Co.**, 609 North Main St., Fort Worth 1, Tex.

Features of the 1957 Dodge truck line

Greatly increased power and load capacities, three-speed automatic transmissions with push-button driving controls, expansion of power steering and power brake into all model types, and new styling are among the features of the new 1957 Dodge trucks. The entirely new "K" series Dodge truck line offers nine engines with 11 different hp. ratings ranging from 113 to 232 hp. This represents an increase of 19% in power in many models. Dodge trucks in the low-tonnage classifications of 9,000 lb. gv.w. offer 120-hp. 6-cylinder engine or a 204-hp. V-engine. The low-tonnage models are offered in pick-up panels, and stakes with maximum gv.w. ratings ranging from 5,100 to 8,800 lb. A new and larger four-wheel-drive truck has 18,000 gv.w. and is offered with a choice of 197-hp. V-8 engine or 130-hp. six-cylinder engine. Horse



the INSLEY type WB

full heavy duty 1 yd. Rock Shovel

- Deck and machinery side stands constructed as a one piece weldment.
- Heavy gauge, all steel cab, $\frac{3}{8}$ " protective rear plates.
- Hook and load roller construction.
- Internal expanding mechanical clutches with booster operated drum clutches.
- Independent boom hoist.
- Gasoline, diesel or electric power.
- Crawler, self-propelled Maxi or Lorry (truck) mounting.
- Fully convertible to all front end attachments.

With optional features for any excavator-crane job:

Power Load Lowering ● Independent Travel ● Third Drum ● Fluid Coupling or Torque Converter

INSLEY MANUFACTURING CORP. • INDIANAPOLIS, IND.
Wholly owned subsidiary / THE MAXI CORP. • LOS ANGELES





The PENNZOIL Company offers a complete line of industrial lubricants including **ZOILDEEZ** motor oil, the answer to the increasing cost of Fleet Maintenance.

- IMPROVED FUEL MILEAGE
- LESS OIL CONSUMPTION
- MORE MILES BETWEEN OVERHAULS
- TUNE-UPS LAST LONGER
- GREATER PROTECTION AGAINST CORROSION
- GREATER PROTECTION AGAINST RUST
- HOLDS CONTAMINANTS IN SUSPENSION
- GREATER BEARING AND VALVE PROTECTION
- NATURALLY HIGH VISCOSITY INDEX PROTECTS LOADED BEARINGS

Branches and Distributors in Principal Western Cities

THE PENNZOIL COMPANY

942 So. Hope

Los Angeles 15

SUPERIOR

CARPULLERS and BARGE MOVING WINCHES

CAPSTAN TYPE • DRUM TYPE • SPECIAL TYPES

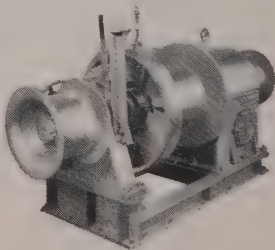


Model SC Superior Capstan Carpuller

Meeting any requirements of speed, space and capacity in Carpullers and Barge Moving Winches has been a specialty of ours for many years. When planning to improve the handling of barges and railroad cars, remember our long experience in the design and manufacture of this equipment is at your disposal.



Model EP Drum Type Carpuller



30 H.P. Electric Mooring Winch

Write for Bulletins and Catalogs

SUPERIOR-LIDGERWOOD-MUNDY CORPORATION

Main Office and Works: SUPERIOR, WISCONSIN, U.S.A.

New York Office, 7 Day Street, New York 7, N. Y.

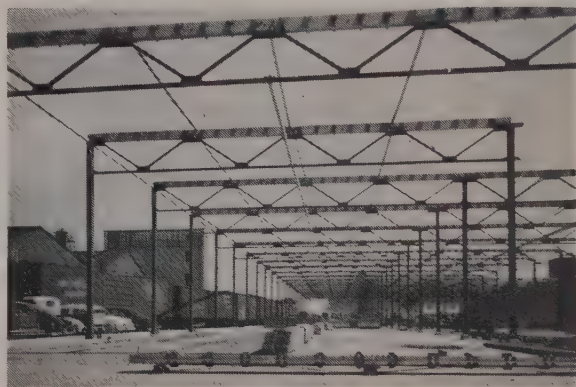
power of the smaller four-wheel-drive Power-Wagon has been increased to 113. Its maximum gv. is 9,500 lb. Cab-over-engine models ranging up to 201 hp. with 22,500-lb. maximum gv. and 45,000-lb. gcw.; six-wheel models



ranging up to 232 hp. with 46,000-lb. maximum gv. and 65,000-lb. gcw.; forward-control chassis and school bus chassis complete the new 1957 Dodge truck line. Push-button driving controls offered for the first time on any truck are available on all low-tonnage and forward-control models, as well as numerous other features. Further information available. **Dodge Truck News Bureau**, 2751 East Jefferson, Detroit 7, Mich.

Buildings of new design use wood timber

The great need for building maximum usable floor space at a low initial as well as low maintenance cost is a challenge which has been met through the development of a new design by **J. H. Pomeroy & Co., Inc.** The floor area, as illustrated, is clear and open with comparatively few columns. The trusses span up to 60 ft. and are of steel with a wood timber used for the top chord member. The diagonal steel members are all alike, as are the



connection plates. These are cut from standard mill lengths without waste. The trusses are designed for economy of field assembly. Erection is accomplished with a small truck-mounted crane. Delivery, hauling, assembly and erection costs of structural framing have been reduced by nearly 50% as compared to the common practice of complete shop assembly. The walls are of precast-tilt-up-concrete and in some cases corrugated metal enclosures were used. For these buildings a plywood roof deck proved to be the most economical. The bay sizes are such that standard 4 x 8-ft. sheets can be used to cover the entire area without any cutting. The sheets are simply laid in place and fastened with automatic nailing machines. To complete the building, the



ELEVATED TANKS



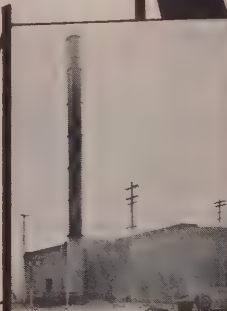
PRESSURE VESSELS



WELDED STEEL PIPE



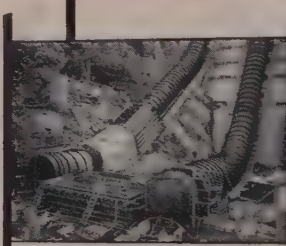
SILOS • HOPPERS • RETORTS



STACKS • BREECHINGS



TUNNEL LINERS



PENSTOCKS

33 years of experience
in STEEL PLATE FABRICATION
at your service!

You can realize substantial savings in time, trouble and money by taking advantage of American's long experience in fabricating a wide variety of steel plate products. Design and manufacturing know-how developed through the years, together with the complete facilities of a 19 acre plant with 183,000 sq. ft. of covered shop area, results in quality products at lower cost. Illustrated here are the solutions to typical problems. Bonus values built into every one of these jobs are the knowledge of the skilled craftsmen, the precision of modern machines, exhaustive testing to assure satisfactory operation, job-timed delivery by our own fleet of trucks, and engineering counsel constantly available.

We'd like to work with you on your job. If it's already designed—call us for estimates. If we can help plan it—our sales engineers are at your service.



518 N. E. Columbia Blvd. Portland, Oregon
 Phone BUtter 5-2531
 Los Angeles • Hayward • San Diego • Phoenix

deck is covered with a 20-yr. composition, hot mopped roof. Buildings of this design are suitable and available anywhere from J. H. Pomeroy & Co., Inc., 120 Montgomery St., San Francisco 4, and at 3625 West Sixth St., Los Angeles 5, Calif.

Time-saving features on John Deere tractors

A direction reverser that permits forward or backward travel at the same speed without shifting gears is the highlight of several new time-saving optional features for John Deere industrial "420" crawler and utility tractors. An easy-to-reach foot throttle which increases engine and ground-travel speeds up to 25%, making pos-

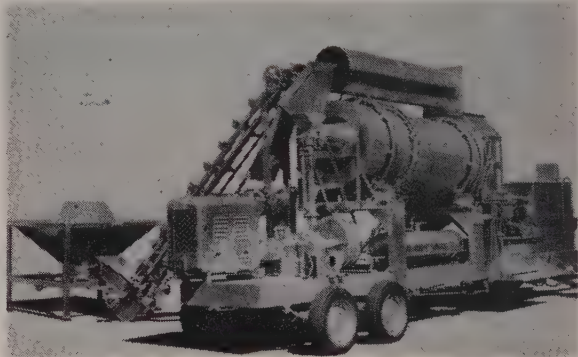


sible travel speeds (with wheel-type tractors) up to 17 mph. on the highway, is another optional attachment. For increased versatility in many operations a five-speed transmission is offered for all models of industrial tractors. The extra speed forward on "420" utility tractors is $6\frac{3}{4}$ mph. and on the crawler, $3\frac{3}{8}$ mph. A heavy-duty three-point hitch is now available for the crawler tractors to combine the advantages of "pick up and go" operation

with the all-weather operational features of John Deere crawler-type tractors. Continuous-running PTO is another optional feature now available, providing continuous operation, when the tractor is stopped, of such equipment as rotary mowers and cement mixers. For further details write John Deere Industrial Division, Moline, Ill.

Low-priced high capacity asphalt plant

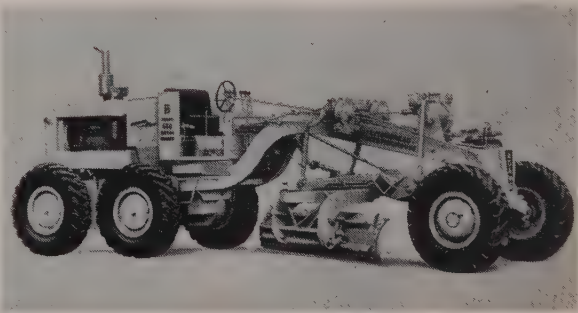
A new asphalt plant, the Model L-10, is announced by the White Manufacturing Co. of Elkhart, Ind. Available as either a portable or stationary unit, it has a 1,000-lb. capacity batch mixer and is rated at 20 tons per hour hot mix. In addition to the 1,000-lb. pug mixer, it has a dryer drum measuring 46 in. in diameter by 10 ft. long, thus insuring an adequate flow of hot aggregate to the volumetric measuring hopper. A two compartment divided



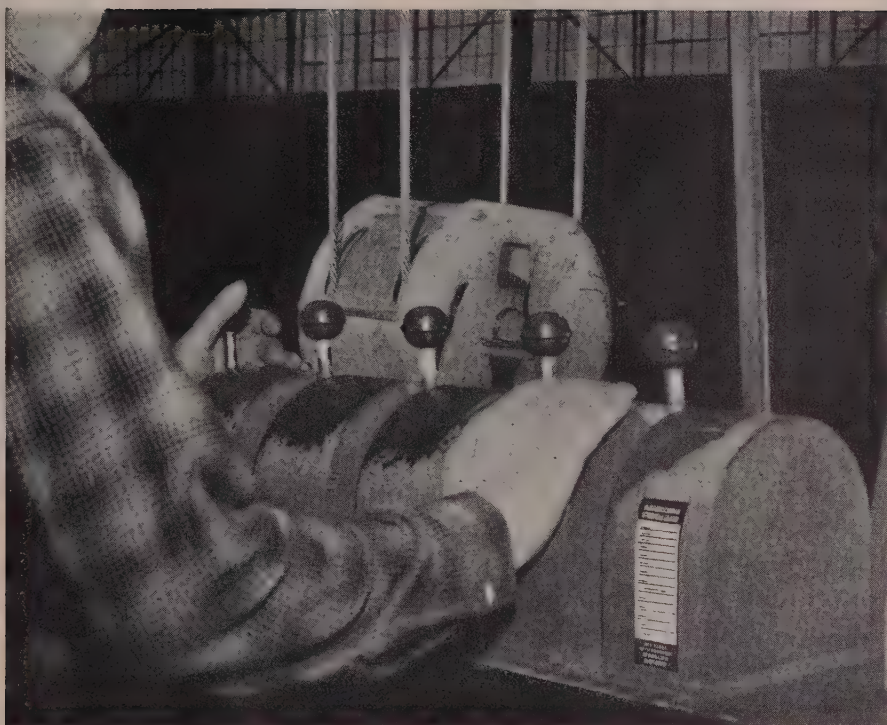
feeder is supplied which can be built up to carry a large quantity of aggregate. It has a reciprocating plate driving from the boot end of the bucket elevator. All equipment on the asphalt plant is driven from a single power unit, either a 50-hp. engine or a 30-hp. electric motor. A 220-

LeTourneau-Westinghouse announces torque converter model of "660" grader

A new addition to their Adams line—a torque converter model of the big "660" motor grader—has been announced by LeTourneau-Westinghouse Co. of Peoria, Ill. Designated as the Adams Power-Flow 660, the unit has basically the same design features as the standard model "660" with the additional operational advantages of a torque converter drive train plus a 27% increase in engine power. The Power-Flow grader teams a 190-hp. diesel power plant with a single-stage torque converter and four range constant mesh transmission. Tripling available torque, this drive system provides the equivalent of an infinite number of gear ratios which adjust automatically to variations in load requirement. The operator can make changes in travel from forward to reverse, and



vice versa, without hand shifting by means of a rocker-type pedal located on the cab floor where the clutch pedal would be in a standard transmission machine. Change of direction is immediate. At all times in this shifting operation the operator's hands are free to manipulate steering, blade and other controls. The torque converter—constant mesh transmission combination of the Power-Flow 660 provides four forward speed ranges from .23 mph. to 27.4 mph. The instant reverse provides an equal number of ranges from .22 up to 24.4 mph. Engine options for the new grader are either Cummins HRFBI 600 or GM 6-71 both rated at 190 hp. The torque converter design uses components manufactured by LeTourneau-Westinghouse. The constant mesh transmission is designed and built by the Adams Division employing many units and parts interchangeable with the standard transmission "660" model grader.



SERVICE-SCORE STICKERS provide valuable wire rope facts

... to test performance, speed reordering

**LESCHEN WIRE ROPE
SERVICE-SCORE**

Equip-
ment _____

Make _____

Equip.
No. _____

Line _____

Rope
Length _____

Rope
Diameter _____

Con-
struction _____

Brand **Red-Strand** _____

Brand _____

Reel
No. _____

Date
Installed _____

Date
Removed _____

Service
in Hours—Yards—Tons—Miles _____

Keep the score
and you'll use it more
**RED-STRAND
WIRE ROPE**

For efficient wire rope operation you must have wire rope facts—brief, handy, accurate facts. You need them for safety (when did that line go on?). You need them for reordering (what size is the hoist line?). And you need them most of all for figuring cost (how long did it last?).

But gathering wire rope facts can be time-consuming—unless you have an easy, simple system.

Leschen's Service-Score Stickers provide such a system. The facts are always at hand—on the machine while the wire rope

is working, and in the record book from then on.

Service-Score Stickers make it easy to compare the service you get from various rope constructions, types, and brands, so you *know which one is best* for you.

With the Service-Score System you prove to yourself that Red-Strand wire rope consistently exceeds industry standards for strength and safety.

Write for your starting supply of Service-Score Stickers now—or see your Leschen distributor.

LESCHEN

**Red-Strand
WIRE ROPE**

Keep the score and you'll use it more—Red-Strand Wire Rope

**LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.**

St. Louis 12, Missouri

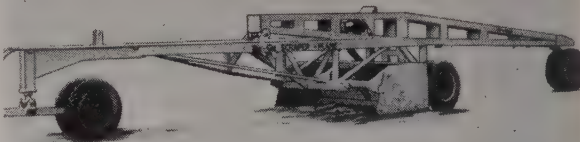


gal. asphalt heating kettle is provided as an auxiliary supply source which needs be heated only hot enough to pump. The L-10 is priced at only \$13,000 for the stationary plant, \$13,500 for the portable plant, f.o.b. Elkhart.

Be-Ge scraper plane for wheel and crawler tractors

A high-speed, easily maneuverable scraper plane especially useful in precision grading in road construction and air field construction is being made by **Be-Ge Manufacturing Co.**, Gilroy, Calif. The hydraulically-operated Be-Ge scraper plane is available in 50, 55, and 70-ft. leveling lengths for use with both wheel and crawler tractors. For job to job transport, the Be-Ge plane can be telescoped and trailed behind a pick-up truck at 40 mph. The

weight of the unit is distributed over the entire length of rigid, trestle-like construction, and will not spring on



hard ground, or sag when the bucket is full. Lever action between scraper plane sections reduces up and down blade travel. Front wheels running over 6-in. rise will raise blade only one inch. Blade diving and digging on either side has been eliminated. No secondary engine is needed to operate hydraulic circuit. The driver controls the entire operation from the tractor seat.

BARNES

33,000 FOR 1*

SELF-PRIMING CENTRIFUGAL PUMPS

*33,000 gallons of water pumped with 1 gallon of gasoline

trouble-free
simplified impeller adjustment — self-lubricating super seal

rugged
heavy, thick wall sections

dependable
non-clogging, trash-type impeller — automatically operated suction valve

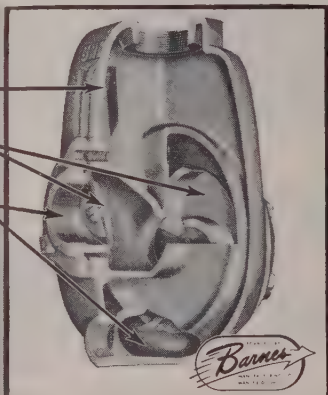
economical
direct flow suction — exclusive self-priming principle

3,000 to 90,000 GPH — Gasoline, Diesel, Electric or Pulley Drives see your Barnes dealer or write for catalog S-1

"Forward action" in 56

BARNES MANUFACTURING CO.

Mansfield, O. • Oakland 21, Cal.



Central Equipment Co., Berkeley, Calif.

The C. H. Jones Equipment Co., Salt Lake City, Utah

Larson Equipment Co., Los Angeles, Calif.

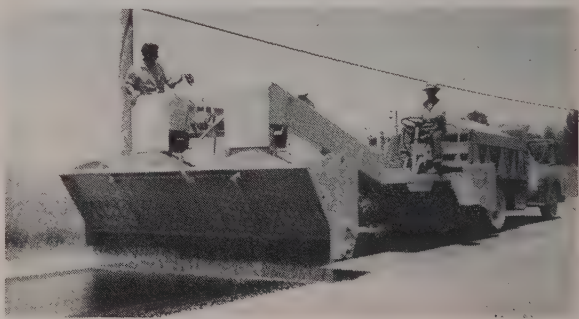
Lowry Equipment Co., Redding, Calif.

The Rix Co., Inc., San Francisco, Calif.

Write Department L-126 for Details

Flaherty Mfg., Inc., redesigns power spreader

Shown in operation is the new Model C self-propelled Spread-Master power spreader manufactured by **Flaherty Mfg., Inc.**, P. O. Box 1042, Pocatello, Idaho. An adjust-



able screen on the bottom of the front hopper places large aggregates in asphalt first and fines on top. The 13-ft. spread hopper has ample storage capacity, making possible a continuous spread. Cutoff gates permit a spread from 6 in. to 13 ft. Hand-actuated control gates are adjustable for uniform overall opening in stops of 1/16 in. The self-propelled spreader is powered by a 57-hp. gasoline engine tractor and has five forward and five reverse speeds with midship shuttle gear transmission. Heavy power steering on the tractor and Bendix hydraulic brakes are standard equipment. Literature is available from the manufacturer.

SCAFFOLDING

SALES — RENTALS

FOR GREATER SAFETY...EFFICIENCY...ECONOMY



THE PATENT SCAFFOLDING CO., Inc.

Dept. WC

6931 Stanford Avenue, Los Angeles 1, California

Phone: Pleasant 2-2571

420 Eighth Avenue N., Seattle, Washington

Phone: Seneca 7142

SHORING

SIDEWALK BRIDGES HOIST TOWERS

Hansen Lime & Stucco Co.

..... 1574 S.W. Temple St., Salt Lake City, Utah

Allied Industries, Inc. 1028 East First St., Spokane, Wash.

Columbia Concrete Pipe Co. Foot of Ninth St., Wenatchee, Wash.

James A. C. Tait Co. 316 S.E. Madison St., Portland, Ore.

YOU'LL HEAR THERE

THE ARBA CONVENTION

will open Monday morning, January 28, 1957, with suitable ceremonies. For five days you will have the opportunity of attending the greatest seminar on roads and road construction ever gathered together. Every effort has been made to secure people of importance and authority to talk to you on the critical subjects of the industry.

You will hear:

- Senator Albert Gore of Tennessee
Chairman of the Senate Sub-Committee on Roads
- Senator Dennis Chavez of New Mexico
Chairman of the Senate Committee on Public Works
- Rep. George H. Fallon of Maryland
Author of the Highway Bill and
Chairman of the House Sub-Committee on Roads
- Senator Francis Case of South Dakota
Ranking minority member of the
Senate Sub-Committee on Roads
- Rep. Charles Buckley of New York
Chairman of the House Sub-Committee on Public Works
- Rep. J. Harry McGregor of Ohio
Ranking minority member of the
House Sub-Committee on Roads

—and many other well-known authorities on the Road situation. These men have played a great part in the formation of the coming road program. No group knows the subject better.

Technical Sessions will begin Monday at 1:30 P.M. and *You will hear:*

- W. A. Warrick, Consulting Engineer of the John Clarkson Co. of Albany, N. Y.; and K. B. Woods, Head of the School of Civil Engineering, Purdue University. They are outstanding authorities on "The Design of Rigid Type Pavements."
- Fred F. Florence, President of the American Bankers Association (Republic National Bank of Dallas, Texas) will speak on "The Bankers' Part in the Accelerated Federal Aid Road Program."

• A. E. Johnson, Executive Secretary, American Assn. of State Highway Officials, Washington, D. C., talking on "State Financing of the Road Program."

• A. C. Clark, Deputy Commissioner, Engineering Div., U. S. Bureau of Public Roads. His address will be, "Engineering the Accelerated Road Program."

• George M. Foster, Chief Deputy Commissioner, Michigan State Highway Department, East Lansing, Michigan, will talk on "Building Roads with Modern Engineering Methods."

Other important subjects will be discussed by Nationally Known Experts.

- James W. Spencer, Highway Research and Extension Engineer, Department of Agricultural Engineering, Cornell University. President, Educational Div. of ARBA. He will discuss, "Keeping Highway Engineering Education Abreast of Modern Techniques."
- Fred Burggraf, Director, Highway Research Board, Washington, D. C., will give a report on "AASHO Illinois Test Road."
- J. E. Buchanan, President, The Asphalt Institute, University of Maryland, will give an address—"Bituminous Materials for Pavement Construction."
- C. Homer Cash, Road Engineer, Michigan State Highway Department, Lansing, Michigan, will talk about "Reinforcing Concrete Design Practice in Michigan."

There will be panel discussions on the many problems of the engineer and contractor. Photogrammetry, electric computers, traffic problems, maintenance, bituminous pavement construction, stabilization, financing, illumination and related subjects will all be treated in detail.

This is just a small part of the total program. **MAKE YOUR PLANS TO ALLOW SUITABLE TIME TO ATTEND THESE IMPORTANT SESSIONS.**

INTERNATIONAL AMPHITHEATRE CHICAGO

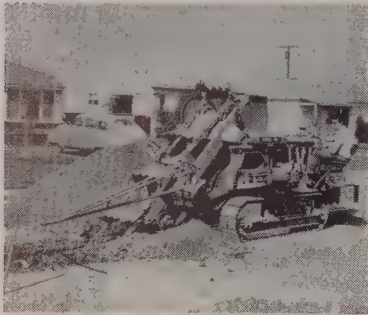


Increased rotation for sinker drill

A faster, stronger rotation, resulting in increased drilling speeds and hole footage, has been achieved in the Le-Roi Cleveland H-10 sinker drill, according to the manufacturer, **Le Roi Division, Westinghouse Air Brake Co.**, Milwaukee 1, Wis. By increasing the metering limits of the valve and valve block, fast drilling speeds are possible in both hard and soft formations due to the extremely short travel of the valve. The new valve and valve block are interchangeable with those previously used in the H-10 sinker drill.

Added digging depth for Parsons Trenchliner

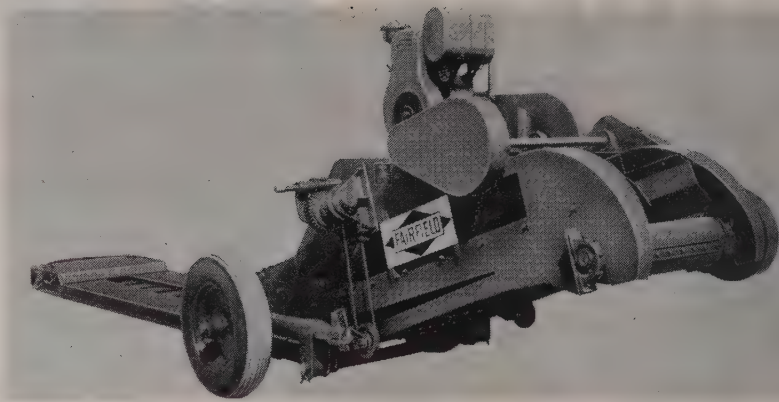
An increase in digging capacity to 10-ft. depth for the Model 155 general utility Trenchliner has been announced by the **Parsons Co.** of Newton, Iowa. The change does not affect the unit's range of digging widths of 16 through 26 in. Compact in design, with a 7 ft. 4 in. height and 5 ft. 4 in. width, the 155 can operate in congested areas. Capable



of producing 5.8 in. to 12.75 lin. ft. of trench per min., the 155 model operates with a range of 30 digging speeds selected by lever control. By changing a simple sprocket, a higher range of speeds is made available to produce a maximum of 25.17 lin. ft. of trench per min. Either gas or diesel power is furnished with the unit.

Turbo-charged diesels for compact power

Three series of turbo-charged diesels are being offered by **Hercules Motor Corp.**, Canton, Ohio. The TCD-501, a 6-cylinder model, has a 4½-in. bore by 5¼-in. stroke and produces 178 hp. at 2,000 rpm. The TCD-895 is also a 6-cylinder engine but with a 5½-in. bore by 6-in. stroke and develops 320 hp. at 2,000 rpm. In both these models, the turbo-charger may be positioned to fit the particular application. The TCD-1468 is an 8-cylinder Vee type model and has a 6¼-in. bore by 6-in. stroke.



Fairfield announces new belt car unloader

A new and improved Belt Car Unloader, Model 109, has been announced by **Fairfield Engineering Co.**, 324 Barnhart St., Marion, Ohio. The model 109 Belt Car Unloader handles up to 185 tons per hr. of 100-lb. cu. ft. material at 100 fpm. or 140 tons per hr. at 75 fpm. The sec-

tion between the car and rails is tight for easy clearance of hoppers and rails and is rigid and strong. Special bars welded to chain links support the edges of the belt to reduce sagging and aid in sealing. The inclined section rises at an angle of only 18 deg. minimizing roll-back.

The unit develops 520 hp. at 2,000 rpm. Specification bulletins available.

Final drive seal for Cat tractors

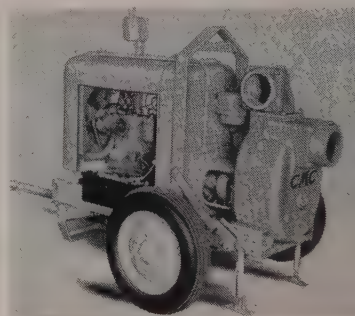
A final drive bellows seal for Caterpillar tractors called Sure-Seal is now being marketed which has in addition to the regular bellows a neoprene "O" ring seal inside two metal flanges. This extra seal prevents lubricant in final drive housing from reaching the rubber bellows, giving double protection against loss of lubrication and subsequent loss of time spent in replacing leaking seals. The Sure-Seal outer bellows keeps water and dirt out and the inner seal keeps the grease in. Sure-Seals are available for the final drive of Caterpillar tractors D-4, D-6, D-7, and D-8. **Sure-Seal Equipment Co.**, 1820 N. W. 25th Ave., Portland, Ore.

42-hp. Sheppard diesel

Designated Model 19, a new Sheppard 4-cylinder diesel of 153.6-cu. in. displacement is rated at 42 gross bhp. at 2,000 rpm. A noteworthy feature of this new diesel is its compact size. Intended primarily as replacement power where service conditions are too rugged for gasoline engines, the new Sheppard Model 19 is installed without alterations to driven machines. It is available as a fan to fly-wheel engine, as an open power unit, standard power unit or closed power unit. It is also offered as a 10, 12 or 15-kw. generating set. Complete information available from the manufacturer, **R. H. Sheppard Co., Inc.**, Hanover, Pa.

Small contractor's pump

Construction Machinery Co. of Waterloo, Iowa, announces its new 6-in. model 90-M contractor's pump which handles such jobs as dewatering excavations, cofferdams, sump or basements, as well as transferring or supplying liquids. Dual volute priming action assures fully automatic priming. The machine is powered by the radiator cooled 244-cu. in. Continental engine, which devel-



ops a constant 55 hp. at 1,800 rpm. Safety controls automatically shut off the unit in cases of high engine temperature or low oil pressure. The pump is available with either skid steel wheels, or 550 x 16-in. pneumatic-tired wheels.

New line of road forms

A new line of general purpose road forms, available in both single and double wedge lock types, is announced by **General Road Machine Inc.**, Niles, Ohio. Constructed of alloy steel and electro-welded for extra strength and long service life, they feature tapered sliding lo-



Why nothing but Asphaltic construction could do for this new approach to the Golden Gate Bridge...

A difficult job of repaving and widening the
Waldo Grade on U. S. 101 is completed. And
the new highway is now rolling on wide ribbons of velvet
smoothness.

Asphalt construction was picked for many
reasons. The traditional ones, of course. First
low cost. Fast working characteristics. Dura-
bility. Smooth riding. Skid-resistance. Eco-
nomical maintenance.

But there was another important considera-
tion, too. The added width of this project had
to be constructed in steep, hilly terrain. Nearly

all fills were the side fill variety. Thus, it was
anticipated that some settlement would occur
at the junction of the new fill and the original
ground.

Cracking *did* occur in the dense graded mix.
Cracking that would have proved costly, time-
consuming . . . if not an insurmountable handi-
cap . . . for any other paving material but
Asphalt.

With Asphalt construction, however, the
cracking was filled . . . the wearing course laid
. . . and smooth riding assured for generations.

According to the State of California's
own averages . . . the savings effected
by using Asphaltic Concrete on the
new Waldo Grade Project were
\$78,564 per mile. Or . . . \$290,115 for
the 3.68-mile job. A whopping big
43.8% saving!

WILLIAM A. RUSSELL

The paving of this out-
standing Waldo Grade
job was done by the
A. G. Raisch Company
... under the supervision
of "Bill" Russell. Mr. Russell writes:
"I have used Asphalt construction for
25 years. I firmly believe that Asphalt
can provide the finest surface any-
where it is placed."



THE ASPHALT INSTITUTE, Asphalt Institute Building, College Park, Maryland



Ribbons of velvet smoothness . . .
MODERN ASPHALT HIGHWAYS

joint connections which are reputed to assure quick, positive alignment. Lock joint connections also reinforce form treads at joints to prevent tread distortion. Quick delivery is assured for many popular types and sizes of road forms, and the company will also design and build special forms to meet specific requirements.

35-ton Lorain Moto-Crane

A 35-ton Moto-Crane, model MC530W, has been added to the Lorain line of power shovels and



cranes, manufactured by the Thew Shovel Co., Lorain, Ohio. The rubber-tire carrier is 122 in. wide

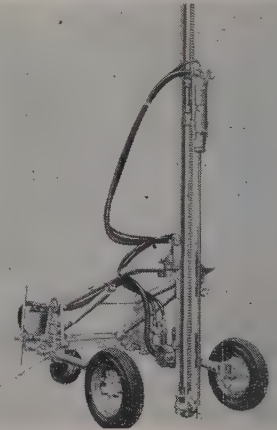
and 28 ft. 6 in. long. It is powered by either gasoline or diesel engines through either of the 10 or 15-speed transmission sets available. Highway speeds up to 37 mph. Hydraulic, power-assist steering is standard. The new Lorain "Shear-Ball" mounting, providing for mounting the turntable to the carrier, eliminates all adjustment and maintenance of center pins, center pin nuts, and top or bottom rollers. The front and rear outrigger beams and boxes are completely removable for lower weight for highway travel. A square-tubular chord crane boom of alloy steel can be used in lengths up to 110 ft. Full details about the new Moto-Crane and attachments available from the manufacturer.

New truck body hoist

Perfection Steel Body Co. of Galion, Ohio, announces a new truck body hoist which offers two cylinders for the price of one. For use with 12 to 16-ft. bodies having payloads of 8 to 12 tons, the hoists and lifting mechanism are mounted in a structural steel sub-frame which is easily mounted and quickly transferred to a new chassis on "trade in" of old. Piston stroke is a long 26 in. giving a dumping angle of 40 deg. Twin cylinders have a diameter of 5 1/4 in.

New design for wagon drill

A new, heavy-duty wagon drill, with the feed shell behind the center line of the large wheel axles providing a more substantial drilling carriage, and with an air motor feed which eliminates most sticking of steel, has been put on the market by the Le Roi Division, Westinghouse



Air Brake Co., Milwaukee 1, Wis. The new drill, No. DR40, is designed for vertical or horizontal drilling in hard formations. The entire unit, including feed shell and D14DR 4-in. drifter recommended for use with the drill, weighs 1,500 lb.

... still the leader for quality at a **LOW PRICE!**



Herman Nelson "THRIFTY" Portable Air Heater

- Better than ever—vastly improved design
- New all-weather overheat safety control
- 90-second starting cycle—even at sub-zero temperature
- Heat output can be easily regulated
- Fewer moving parts assure longer, trouble-free service




HERMAN NELSON

Best Known Name in PORTABLE HEATERS

... a product of American Air Filter Co., Inc., Louisville, Ky.

Ideal for Winter Construction jobs. Choose the portable heater that's designed especially for your needs . . . the new Herman Nelson "Thrifty"! Gives you low first cost and low operating cost—gives you the safety and dependability of "sealed flame" indirect firing. Oil-fired, uses only 0.7 to 1.25 gallons of fuel per hour. Electric motor powered. The

BOISE, Idaho.....Arnold Machinery Company BUTTE, Montana.....Pioneer Equipment & Supply Co. CASPER, Wyoming.....Studer Tractor & Equipment Company DENVER, Colorado.....Western Machinery Company EUGENE, Oregon.....Loggers & Contractors Machinery Co. FRESNO, California.....Edward R. Bacon Company GRAND JUNCTION, Colorado.....Western Machinery Company IDAHO FALLS, Idaho.....Arnold Machinery Company	OAKLAND, California.....Edward R. Bacon Company PORTLAND, Oregon.....Loggers & Contractors Machinery SACRAMENTO, California.....Edward R. Bacon Company SALT LAKE CITY, Utah.....Arnold Machinery Company SAN FRANCISCO, California.....Edward R. Bacon Company SEATTLE, Washington.....A. H. Cox & Company SPOKANE, Washington.....Western Machinery Company TACOMA, Washington.....A. H. Cox & Company
--	--

"Thrifty" may be used indoors or out, and canvas duct may be used to spot heat where wanted. Also has provision for venting, when desired. New simplified control system has only one fuel control valve, one starting switch. Your Herman Nelson dealer offers you liberal trade-ins on your old job-worn heaters!

NOW...Graham Bros. gets Cal-Rex Front Engine PTO Moto-Mixers!



*Part of Graham Cal-Rex
fleet showing new Cal-Rex
Front Engine PTO
Moto-Mixers.*

Since 1909, Graham Brothers of Los Angeles have been famous for their quality control system of concrete production, every step of the way. To maintain their quality system, here's why Graham use Cal-Rex Moto-Mixers:

1. Cal-Rex Moto-Mixers are especially designed and made in the West guaranteeing Rex dependability under even the most rugged Western operating conditions.
2. Cal-Rex Moto-Mixers are unmatched for their quality mixing features, speed and dependability.

To Graham Brothers' customers, this means better service and constant delivery of quality concrete. To Graham

Brothers, this means greater demand for their services, higher profits and lower operating costs.

New Cal-Rex Front-Engine PTO units add extra cost savings

The most recent additions to the Graham fleet have been new Cal-Rex Front Engine PTO units. The Rex PTO units drive the mixer drum from the front of the truck engine eliminating the mixer engine and its weight, fuel costs and maintenance. This new PTO offers all of the best mixing quality and operating control. Why not see your Rex Distributor for full details on the Cal-Rex Moto-Mixer line?

Chain Belt Company • 7601 Telegraph Road, Los Angeles • Phone: RAYmond 3-5227



CHAIN BELT COMPANY

40-ft. concrete conveyor

Elevations to 20 ft. at 30 deg. are possible with the completed addition of a 40-ft. conveyor called Con-Vay-It Concrete Special, manufactured by American Conveyor Co., 2133-37 South Christiana Ave., Chicago 23, Ill. Powered by a 9-hp. Wisconsin gasoline engine, this unit can pour approximately a yard per min. in the horizontal position. A snub pulley has been added to increase belt power by as much as 20% and is designed to prevent packing of concrete. The 12-40 Con-Vay-It Concrete Special conveyor unit can be equipped with a High-Boy elevating device and complete swivel wheel assemblies permitting sidewise movement when pouring wall forms. Front and rear swivel wheel frames have been designed for the line to serve the need of horizontal conveying on slab pours. Three standard lengths of 20, 30 and 40 ft. are now available.

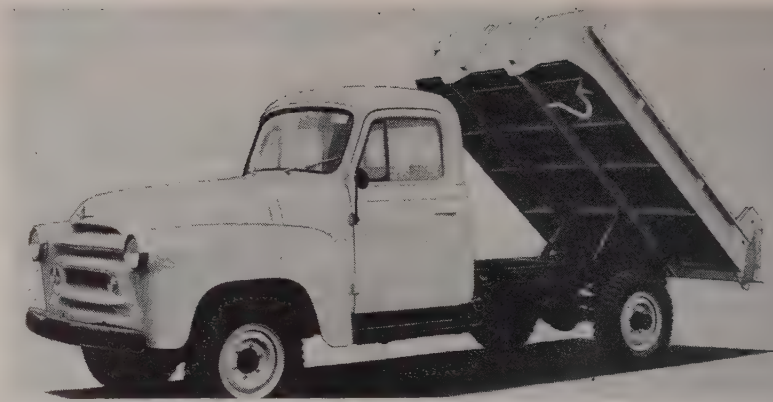
Concrete accelerator lowers freezing point, speeds setting

Concrete can be poured safely down to 15 deg. F. according to an announcement made by Forrer's, a division of the Spray-O-Bond Company, Milwaukee, manufacturers of Forrer's Accelerator. This new improved Accelerator for portland cement lowers the freezing point and speeds up setting. The solution is available in 1, 5, 30 and 55-gal. drums and is easy to measure by just adding to gaging water used in each mix. Rust inhibitor added to the mix prevents it from affecting reinforcing steel or tools. For further details write Forrer's, 2225 North Humboldt Ave., Milwaukee 12, Wis.



Moldboard shock ups grader speeds

A new product designed to decrease road maintenance time has been developed by the Over-Lowe Co. The "Hi-Speed" moldboard shock fits most standard graders and through a resultant floating blade enables the grader operator to maintain road speeds up to 12 mph. According to the manufacturer, other grader economies are made possible



Dump bodies for IH truck

Availability of dump bodies with low loading height as factory-mounted equipment for the new light-duty International four-wheel-drive model S-120 truck has been announced by the motor truck division

of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill. Hoist and body are controlled by a single lever to operate the power take-off and pump valve. A 1½-yd. body can be mounted on the 134-in. wheelbase chassis.

Symons scaffolding bracket

A new galvanized steel scaffolding bracket, recently introduced by Symons Clamp & Manufacturing Co., is a light, compact unit that can be secured with standard form hardware. Completely collapsible to simplify handling and moving, it will accommodate three 2 x 10's for a platform. Handrail bars will support a 2 x 4 at a height of 42 in. above the platform. When handrail is not required the support bar may be pivoted down flush with the horizontal member of the bracket. Recommended safe working load is 1,000 lb. per bracket. Symons Clamp & Manufacturing Co., 4249 Diversey Ave., Chicago 39, Ill.

Choice of diesels on Huber-Warco motor graders

Huber-Warco Co. of Marion, Ohio, announces the addition of Cummins diesel powered units to its line of 6-D and 7-D series motor graders with torque converter and full power shift transmission. The new models are the 6-D2, powered by a 125-hp. JN-6-BI Cummins, and the 7-D2, powered by a 150-hp. JBIS-600 Cummins diesel. The 6-D2 and 7-D2 are similar in design to the 6-D and 7-D which carry GM diesels. Standard features on the models include Huber-Warco's combination of torque converter and full power shift transmission, and a power sliding moldboard which is operated hydraulically from the cab along with all other position controls. Complete details may be obtained by writing the company.

Pressure sensitive felt tape

Now on the market is a high-grade felt tape which has been coated on one side with a pressure sensitive adhesive applied in "track form" to give it additional strength. The new tape is supplied in roll form and in die-cut and segmented form. Further information about Spring-Felt No. 124XN-T is available from the Spring Packing Corp. Dept. PR 333, South Michigan Ave., Chicago 4, Ill.

GM diesels on Michigan models

Clark Equipment Co.'s Construction Machinery Division is offering General Motors diesel engines as optional power plants on two models in its Michigan tractor shovel line. The Michigan 175A is now available

because the new shocks eliminate high speed grader bounce and prevent damaging of road surfaces. Blade life is increased because the blade "floats" when shocks are used, and tires last longer because they can maintain proper air pressure at all times. Literature is available from the manufacturer, Dept. AK, P. O. Box 2879, Denver 1, Colo.

800

more tons per day
of incineration for
BALTIMORE, MD.



charging floor



stoking floor

PITTSBURGH • DES MOINES *Incineration Plants*

Matching Baltimore's civic growth, this great new 800-ton Pittsburgh-Des Moines Incineration Plant is the city's second large PDM unit. Employing mechanical stoking for its four furnaces, the new plant has operated steadily beyond rated capacity from the first day in service. *Send for our latest Modern Refuse Incineration Brochure.*



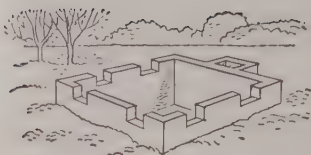
PITTSBURGH • DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES, SANTA CLARA, FRESNO, and CADIZ, SPAIN

Sales Offices at:

PITTSBURGH (25) 3420 Neville Island
NEWARK (2) 219 Industrial Office Bldg.
CHICAGO (3)
1224 First National Bank Bldg.
EL MONTE, CAL P. O. Box 2068
MADRID, SPAIN Diego DeLeon, 60

DES MOINES (8) 921 Tuttle Street
DALLAS (1) 1225 Praetorian Bldg.
SEATTLE 528 Lane Street
SANTA CLARA, CAL.
627 Alvise Road



EFCO FORMS for house foundations

EFCO Steel Forms for concrete construction are adaptable to wide use by their owners, including construction of house foundations. Other advantages:

- Lifetime steel faces should never need to be replaced.
- Easy to handle and assemble.
- Saves time, material, money.
- Low original cost.

Other forms from Economy are available on a rental basis. Write nearest office for catalog.

Economy Forms Corp. DES MOINES, IOWA

Offices in Denver, Colo.; Los Angeles, Calif.;
Oakland, Calif.

Other offices coast to coast

with a Detroit Diesel Engine Division Model 4-71 engine. Rated at 147 bhp. at 2,200 rpm., the four-cylinder engine has a displacement of 283.7 cu. in. Maximum torque is 366 lb.-ft. at 1,600 rpm. Detroit Diesel's model 3-71 is offered in the Michigan 125A tractor shovel. The three-cylinder, 212.8-cu. in. engine is rated at 105 bhp. at 2,200 rpm. Maximum torque is 275 lb.-ft. at 1,500 rpm. Clark Equipment Co., Construction Equipment Division, Pipestone Road, Benton Harbor, Mich.

Steel construction stake provides fast forming

Positive anchoring in any soil or sub-grade condition is claimed by Universal Form Clamp Co. for their new construction stake. The stake provides an ideal method for use on footings, curbs, gutters, bracing and screeding. Constructed of 3/4-in. round cold rolled bar stock the stakes can be re-used hundreds of times with the advantages of easy driving, accuracy and less soil displacement. The short sharp point provides fast and easy driving. Nailing holes are on 1-in. centers permitting nailing at any point. Standard lengths 24, 30 and 36 in.; other sizes available to meet specific requirements. Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill.

Replaceable digger teeth cut replacement costs

New design principles have been used in the Bulldog replaceable digger teeth for shovel dippers, backhoe buckets, dragline buckets, clamshell buckets and loader buckets just announced by Allied Steel & Tractor Products, Inc., 7835 Broadway, Cleveland 5, Ohio. The new digger tooth has only three parts. First, a universal weld-on adapter that is easily attached by using the old



tooth as a base. Second, an easily changed replaceable tip, and third, two positive lock pins for securing the tips to the adapter. The manufacturer states that using the old tooth as a base for the universal weld-on adapter eliminates the expense of a conventional adapter or new tooth and saves up to 65% on tooth maintenance costs.

New ceiling clip

A new ceiling clip and special guard combination designed to provide powder-actuated stud driver users with a fast, inexpensive method to fasten suspended loads, grids, or structures has been placed on the market by Remington Arms Co., Bridgeport, Conn. The clip is inserted directly into the guard and the stud is driven through the clip into the base surface. Studs designed for steel or concrete applications are available, and the clip itself is a sturdy angle bracket made of 14-gauge steel, zinc plated with a 5/16-in. hole in one leg.

Eveready announces addition to line of Tuffie blades

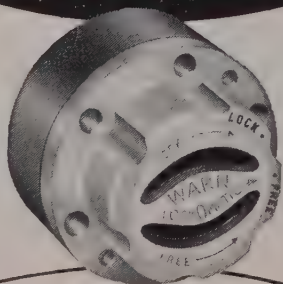
The Eveready Brikshaw Co. announces production of a new 3-ply reinforced Tuffie Blade, Number 10 for use on unusually hard materials such as hard glazed tile, hard brick, certain specimens of native stone and high fired refractories. The Tuffie 103 features 3-ply reinforcing and a new sidewall design with hundreds of extra cutting edges that results in faster, clearer cuts. The Tuffie glass reinforcing makes it possible to drop, bend or twist the blades without breaking or shattering them. For complete information, consult your local Brikshaw Dealer or write direct to the manufacturer, Dept. 294, 15 South Michigan Ave., Chicago 5, Ill.



SAVE ON EQUIPMENT... SAVE GAS, TIRES, REPAIRS

Warn Hubs on your 4-wheel drive make 2 vehicles out of 1, because you can use it as a light duty 2-wheel drive pickup, or 4-wheel drive work horse. Warn Hubs save gas, tires, repairs; stop front gear whine and shimmy in 2-wheel drive—and you have 4-wheel drive whenever needed. Automatically, too, with Warn Lock-O-matics! They select free-wheeling 2-wheel drive or tractive 4-wheel drive as you shift! When road conditions change, you just keep right on going in whatever drive is required. With Warn Hubs, whenever you use 2-wheel drive you're saving on operating costs—and because you have 4-wheel drive too, it's the only light vehicle you need! Lock-O-matic (and Locking) models for all makes 4 W. Ds. to 1½ tons. See Warn Hubs at your dealers, or write:

GET MAXIMUM USE OF YOUR 4-WHEEL DRIVE!



NEW WARN LOCK-O-MATIC HUBS

Give your 4-wheel drive
automatic free-wheeling
2-wheel drive—and
automatic 4-wheel drive
forward and reverse

AS YOU SHIFT!

WARN MFG. CO., Riverton Box 6064 WC12, Seattle 88, Wash.

This earth handling Yuba dredge, designed and built for Charles T. Hover, general engineering contractor, Burlingame, has hull 7' x 40' x 140', carries 6-yard clam-shell. It's designed so digging equipment can be easily removed for use on land.



**TO HANDLE ORE, EARTH
OR AGGREGATES** *Requiring
Specially Engineered Equipment,*

CONSULT YUBA

Yuba brings to your materials handling problems a half century of experience designing and building special machinery — hoists, conveyors, drives, digging, screening and sizing equipment, winches, pumps, hauling units, barges, etc.

We're equipped to engineer a complete system to fit your needs. For example, Yuba-built dredges for mining and aggregate handling usually include digging, processing, and conveying equipment—all in one plant.

We can build in our own shop machinery of almost any size. Facilities include: engineering and designing, structural steel fabri-

cating, heavy and light machining, welding, forging, heat treating, pattern making, export packing and shipping. Thus you have one source, one responsibility for your entire job from designing through supervision of field assembly (where required). You save the headaches of dealing with multiple suppliers.

Our plant is located on San Francisco Bay at Benicia, giving you a choice of shipping by water, rail or truck.

Price-wise, we're competitive. Consult us now for help on specially engineered equipment. Wire, write or telephone EXbrook 2-0274.

109



YUBA MANUFACTURING CO.

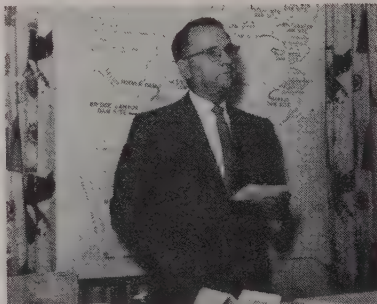
Room 653, 351 California St., San Francisco, Calif.

News of DISTRIBUTORS

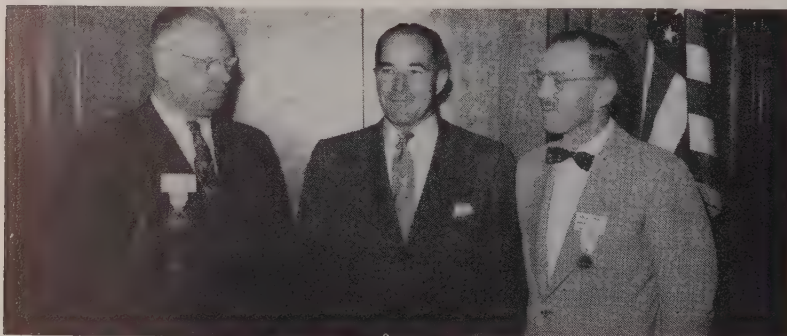
AED Region 14 meets in Salt Lake City



OVER 70 persons attended the three-day conference, October 11-13, at the Hotel Utah. Welcoming the members is **L. T. McGuire**, local AED president.



GUEST SPEAKERS included **E. O. Larson**, regional director, U.S. Bureau of Reclamation, who presented a detailed picture of regional BPR projects.



WALTER S. KERSHAW (left), regional AED director, presided over the conference. With him are guest speaker **George S. Eccles**, president and general manager, First Security Corp., who discussed financing trends; and on the right, **Ray L. Arnold**, who was toastmaster at the opening luncheon October 12.



STAN LASKEY, national AED director, spoke at Saturday luncheon. His subject: "Round and About", a general appraisal of problems common to most distributors.

Williams heads Spokane branch

Recently announced by Jerry Jérôme, president of Columbia Equipment Co., is the appointment of Paul E. Williams as vice president in charge of the Spokane branch. Williams is an associate member of the Northwestern Society of Highway Engineers, and has been in equipment sales for the past ten years. Before his appointment to the staff of Columbia he was associated with Feenaughty Machinery Co.

New dealer for Buck equipment

Safway Scaffolds Co. of Eugene, 260 Ferry St., Eugene, Ore., has been appointed an authorized dealer for the Buck Equipment Corp., Cincinnati, Ohio. Safway will sell and service all of the Buck hoisting machines and accessories in the Eugene area. George O. Custer is the manager.

Sales-service reorganization

In reorganization of the sales and service departments of Foulger Equipment Co., Salt Lake City, Utah, B. L. Foulger, president, announces that Don Foulger, formerly assistant secretary and treasurer, has moved up to vice president and sales manager. From a part-time basis as clerk, Foulger advanced to salesman, representing Clark Forklifts in the Intermountain area prior to being named assistant secretary and treasurer. In other promotions, Lynn Roberts has advanced to the post of parts manager and administrative head of the service department; Keith Perry has been promoted to service superintendent; Homer Dennison will be in charge of shop repairs, and Bill Cooper has joined Foulger as office manager.

Western Equipment Co. expansion

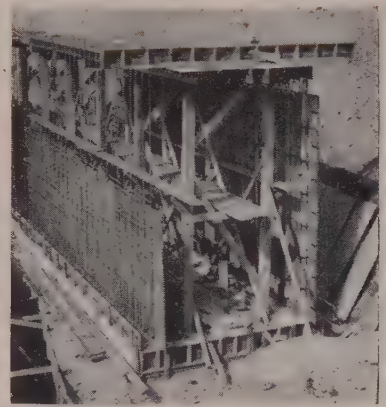
Western Equipment Co. is now operating in a greatly enlarged territory consisting of thirty-three counties in southern Idaho, two in western Wyoming, and Malheur County in eastern Oregon. With headquarters in Boise, the branches are located at Twin Falls, Idaho Falls and Pocatello in Idaho, and a Ontario, Ore., where the following managers are in charge. Boise: B. B. Chisholm, Sr., assistant manager; Jack C. Jensen, sales manager, with Roland E. Peterson as district manager. Harold Jagers is district manager at Twin Falls; Mel Empe at Idaho Falls; Al Cornelison at Pocatello; and Jay Stevens at Ontario. This expansion follows Western's appointment several months ago as Caterpillar dealer and the recent enlargement of the territory for Caterpillar equipment and the products of these allied companies: Athey Products Corp.; Balderson Inc.; C & D Manufacturing Co. Fleco Corporation; Hyster Corp.



RESIDENCE FOUNDATION—Erects fast . . . two liners only on inside; no liners on outside.



LARGE THEATRE in Alaska—Note minimum alignment and bracing.



CONCRETE CULVERT—All Ply panels used 11 times in covering the 336 ft. length.

SUPERIOR ALL-PLY FRAMELESS PANELS CUT FORMING TIME

Unique Combination Clamp and One Blow of a Hammer Does Three Separate Jobs

In all types of concrete form work, from residential to large industrial projects, contractors have reported the versatility and substantial labor saving of Superior All-Ply panels.

The panels are of 1 1/8" plywood, without a metal or wooden frame, yet providing great strength and rigidity. A unique 3-way Combination Clamp (*the only working part*) is the secret of All-Ply's superiority . . . It does 3 separate jobs with one blow of a hammer: (1) Locks the panels; (2) Secures snap tie head, which acts as both spreader and tie; (3) Secures and

draws up liners, which generally are required on one side only.

Weighing less than 5 lbs. per sq. ft., standard ALL-PLY panels come ready for use with Superior Snap Ties.

Panels come in standard sizes of 2 x 4, 2 x 6, and 2 x 8 ft. . . Also special corners and fillers as required.

On your next forming job, discover the convenience and labor saving of All-Ply panels . . . for complete details request a copy of our 12-page catalog.

SUPERIOR
CONCRETE ACCESSORIES, INC.
 4110 Wrightwood Avenue, Chicago 39, Illinois
PACIFIC COAST PLANT
 2100 Williams St., San Leandro, Calif.
NEW YORK OFFICE
 1775 Broadway, New York 19, N.Y.



FLUSH DESIGN—Simplifies stacking the forms at job site. All Ply's weigh less than 5 psf.



MOVING—Absence of wooden or metal frames permits stacking up to 7500 sq. ft. of panels on one truck.



\$3 Million ELEMENTARY SCHOOL—Plywood face and rigid locking of forms by Combination Clamp insure clean, true surfaces.



ONE BLOW of hammer locks panel, secures snap tie, holds liner.



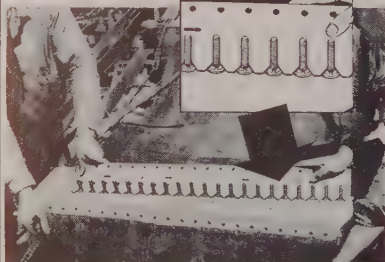
ALL PLY PANELS come in 3 standard sizes: 2 x 4, 2 x 6 and 2 x 8 ft.

NEW FLEXCO POWER TOOLS CUT APPLICATION TIME IN HALF

Your two man belt team can now join a belt 30" wide in 15 to 20 minutes . . . using the new FLEXCO Power Tools.



The FLEXCO Power Tool Boring Bit used with electric or air impact tool speeds boring of holes.



New FLEXCO Templet positions bolts for quick joining of belts. Reaching under belt has been eliminated.



Running down nuts is fast with the new FLEXCO Power Wrench used with electric or air impact tool. Two Bolt Breakers are used together to complete the joint.

If you are interested in speeding up fastener application, order the new Power Tools from your local FLEXCO Distributor. Write for Bulletin F-112-A.

FLEXIBLE STEEL LACING CO.

4704 Lexington Street • Chicago 44, Illinois

pany; Martin Machine Co.; Omaha Steel Works; Preco, Inc.; Rome Plow Co.; Ulrich Manufacturing Co., as well as equipment manufactured by Link Belt Speeder Corp. and the Broderick & Bascom Rope Co.

Mulkey joins Phoenix firm

Sam Mulkey recently joined Western Machinery Co., Phoenix, Ariz.

Bill Spooner and Detroit Diesel

D. W. "Bill" Spooner, salesman with Intermountain Equipment Co., Spokane, Wash., branch, for the past nine years, has been named special representative for the Spokane

territory for the recently acquired Detroit Diesel Engine account. Particular emphasis is being placed on the sale of this equipment in the area, as well as on Euclid earth-moving equipment.

Sales promotions; new branch

Roger Deitz was recently appointed sales manager for Seitz Machinery Co., Inc., Billings, Mont., and George Glass was named sales representative. Glass was district representative for P&H shovels before joining the Seitz organization. Also announced is the recent opening of a new branch in Bozeman, Mont.

Construction equipment displayed at Mining Show

Manufacturers of construction equipment put their machines on display for an audience of mining men at the 1956 Mining Show in Los Angeles, Oct. 1-4. The 160 exhibitors had an

audience of more than 6,000 registrants, including representatives of nineteen foreign countries. Equipment included machines common to the construction and mining industries.



PIONEER Engineering Works scale model of a crushing and screening plant, demonstrated by *W. A. Rundquist*, vice president.

CATERPILLAR Tractor Co. displayed a DW-21 tractor with PR21 rear dump trailer. *G. F. Roll*, with *Athey Products Corp.*, provides an idea of the size.



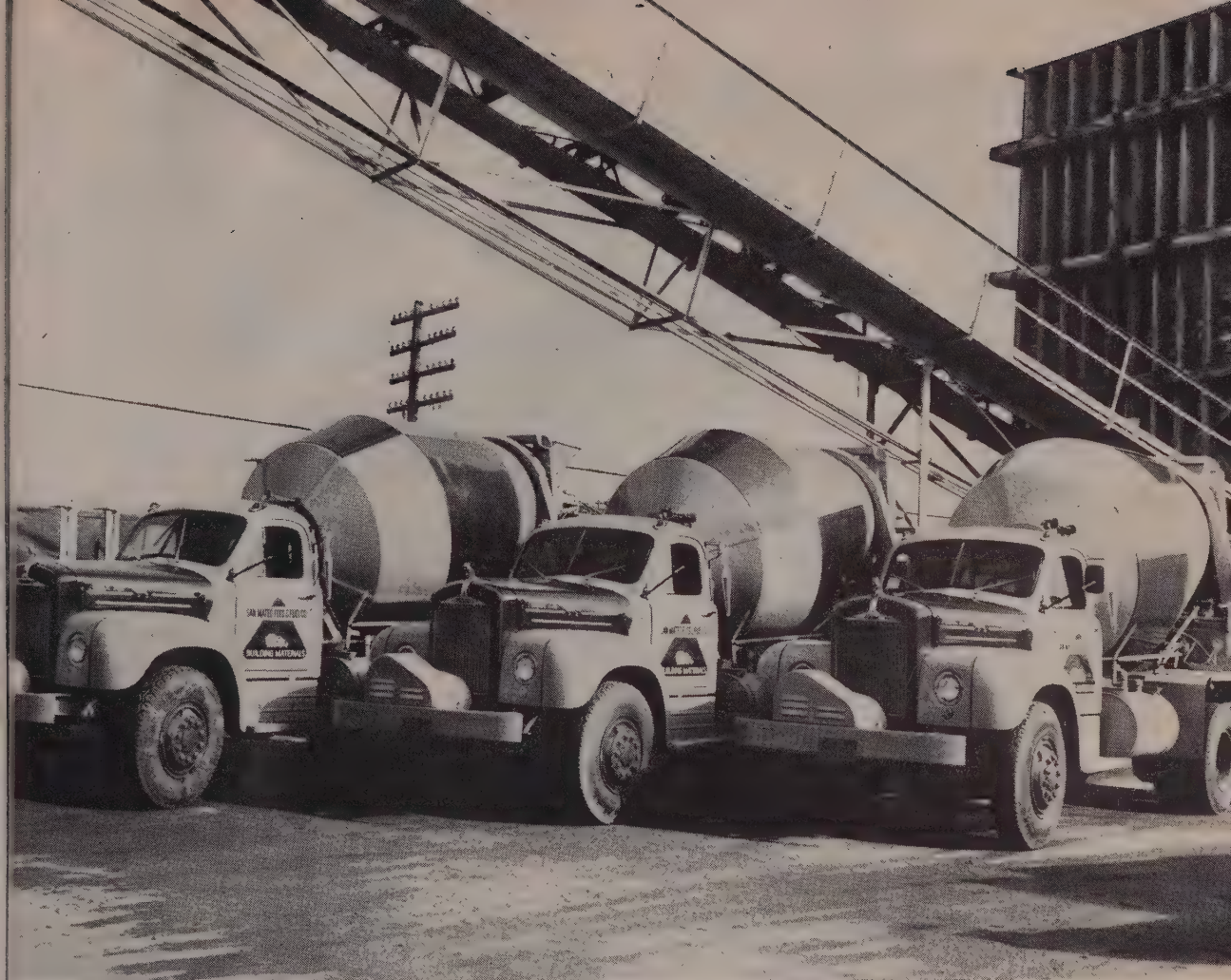
LE TOURNEAU-Westinghouse Model B rear dump looks really big to *David R. Harney*, sales promotion supervisor.

AMSCO'S 7-yd. dipper is looked at with pride by *Thomas C. Baker*, Chicago sales manager.



AUSTIN-WESTERN Company Super 99 road grader being shown in action.

THE EIMCO Corporation put on a full display of its line.



These three Mack model B421S concrete mixers are part of the big San Mateo Feed & Fuel Company's fleet. Macks have helped set the pace for their growing operation since 1951.

**compared to all other makes in our fleet . . .
MACK's performance and maintenance records
were outstanding . . . that's why we bought
35 more**

—R. C. Hughes, President
San Mateo Feed & Fuel Company
San Mateo, California

Proof of performance is what Mr. R. C. Hughes, president of San Mateo Feed & Fuel Company, demanded before buying 35 new Macks—21 model B421S mixers, and 14 model B30P dumpers.

"We relied on our records," commented Mr. Hughes, "when the time came to make a major decision for modernizing our fleet. The answer was clear . . . in our mixed fleet Macks were the stand-outs for fuel economy, low maintenance cost, and over-all earning capacity.

"We bought our first six Macks in 1951, and added 14 more in 1952. Now, with the addition of 35 new units, our fleet contains 55 Macks. We consider our big investment in Macks an important factor in building increased profit into our rapidly growing business."

Get the facts on Macks before you buy another truck. See your Mack Branch or Distributor and find out how Mack can give you top performance and economy in every trucking operation.

4014

MACK TRUCKS Los Angeles • Denver • Portland • Seattle • San Francisco • Salt Lake City • Albuquerque

MANUFACTURERS

Davey promotes G. B. Edgell

Appointment of G. B. Edgell as manager of the engineering department of Davey Compressor Co. is announced. He has been affiliated with Davey since 1940, and since 1945 has been director of automotive engineering. In his new position he will be located in the company general offices in Kent, Ohio.

Prime Mover Control Conference

More than two hundred technical representatives from some of the largest companies in the United States and eight foreign countries attended the twentieth Prime Mover Control Conference conducted by the Woodward Governor Co., Rockford, Ill. The conference is the largest source of technical information on hydraulic governor theory, application, maintenance and operation in the United States.

Homelite expands

Homelite, a division of Textron Inc. of Port Chester, N. Y., has announced plans to build a new 135,000-sq. ft., modern one-story factory building in Gastonia, N. C., for the production of its gasoline-powered chain saws. Construction is starting now and full operation of the plant is expected by the fall of 1957.



UTILITY TRAILER Manufacturing Co.'s newly opened million dollar trailer plant in Puente, Calif. According to *John Bennett*, president of the forty-two-year old trailer manufacturing company, construction of this unit now permits production of many of the "advanced design" features already developed by Utility.

New field sales manager appointed

Macwhyte Company, Kenosha, Wis., manufacturer of wire rope, recently appointed *Russell J. Whyte* as field sales manager. For the past twelve years Whyte has been a district factory representative in California.

Bros appoints new asst. sales mgr.

Donn Bros has been appointed assistant sales manager for the *Wm. Bros Boiler & Mfg. Co.*, Road Machinery Division, Minneapolis, Minn. He has been a part of the Bros organization since 1947, most recently as

technical advisor to the distributor organization on compaction, bituminous handling and other equipment of the manufacturer.

New product managers

James G. Morris, industrial sales manager for *Seaman-Andwall Corp.*, Milwaukee, Wis., manufacturer of road building machinery, announces the appointment of *Frank D'Amato* as product manager of the Century material spreader line. D'Amato was designing and sales engineer for Century Engineering Co. for eight years prior to the purchase of its line of

Increase Dragline Efficiency with Bucyrus-Erie All-New Dragline Buckets

New concepts in design plus a special new light-weight alloy in Bucyrus-Erie dragline buckets offer you new efficiency in dragline operation. Look at these outstanding advantages:

Easy Loading—A "slicing-action" lip rapidly penetrates even tough materials, and a scientifically tapered basket permits full, heaped loads.

Less Bobbing, Spillage—Proper design incorporates correct flaring and balance of the bucket for clean carrying.

Fast Dumping—Smooth interior design and high arch permits quick, clean dumps.

Exclusive BECOLOY—A new special alloy developed by Bucyrus-Erie combines great strength with light weight, adds wearing ability and impact resistance.

New Bucyrus-Erie dragline buckets are available in three types: light, medium and heavy duty—solid or perforated. Your Bucyrus-Erie distributor has the experience to help select the right size and type for your operations. See him soon.

22R56



**BUCYRUS
ERIE**

SOUTH MILWAUKEE, WISCONSIN



See page 65 for list of distributors

materials spreaders by Seaman-And-wall. Also announced is the appointment of C. Frank Riddle as product manager for the Pulvi-Loader division. Prior to the purchase of the Willimon Mobile-Loader by the firm, Riddle was design and sales engineer for that equipment.

Standard Steel names executives

Announcement is made by Robert S. Burns, president of Standard Steel Corp., Los Angeles, of the advancement of Walter J. Kalmeyer to vice president, and Clay C. Hopper to



Kalmeyer



Hopper

assistant general manager. Norman Pitt was appointed chief engineer, and Edward J. Meier, public relations director. Kalmeyer will continue to serve as production manager in addition to supervising all phases of manufacturing. Hopper will assist



Pitt



Meier

C. N. Rees, executive vice president, in management and administration, while Pitt as chief engineer will be responsible for supervision of all design and engineering activities on the firm's asphalt plants and other products. Under Meier, the company's public relations program is to be considerably expanded.

Calaveras acquires 5 supply firms

A majority of the stock in five transit-mix and gravel producing companies in California's Central Valley has been purchased by Calaveras Cement Co. The companies are Standard Materials Co., Inc., Modesto; River Rock, Inc., and Concrete Supply Co., Inc., both of Merced; Merced Sand & Gravel, Inc., Atwater; and Standard Rock Co., Inc., Escalon.

American Hoist buys Texas plant

Expansion of American Hoist & Derrick Co. through purchase of a Longview (Tex.) company, is announced by John E. Carroll, presi-

UNI-FORM Concrete Forms

INCREASE Labor Productivity!



Progress
in
10 Working
Days



Form more contact area per man hour with **UNI-FORM** Concrete Forms... the **MECHANIZED** concrete forming system

UNI-FORM
Concrete
Forms
Provide:

- FASTEST FORMING SYSTEM—ground to ground
- Automatic accuracy of wall widths for faster erection
- Alignment and bracing on 1 side only—substantially reduces labor, material cost
- Fast job starts . . . Ready to use when they reach the job—save time
- LOWEST ALL AROUND CONCRETE FORMING COSTS

SEE YOUR LOCAL DISTRIBUTOR



K. C. CONSTR. SUPPLY CO.	Denver, Colo.
UNIVERSAL FORM CLAMP CO.	San Leandro, Calif.
UNIVERSAL FORM CLAMP CO.	Los Angeles, Calif.
UNIVERSAL EQUIP. CO.	Seattle 2, Wash.
MCCRACKEN RIPLEY CO.	Portland 12, Oregon

MANUFACTURED BY
UNIVERSAL FORM CLAMP CO.

GENERAL OFFICES AND FACTORY: 1238 N. Kostner • Chicago 51, Illinois

Copyright 1954 by UNIVERSAL FORM CLAMP CO., Chicago 51, Ill.

EASY TO REPLACE ON THE JOB

Tamprite Tips

NO WELDING!

DRIVE OFF WORN TIPS

DRIVE ON NEW TIPS

PREVENT COSTLY DELAYS by equipping your sheeps foot rollers with Tamprite Tips and Shanks. Simple to replace on the job. Available for immediate delivery. Write for information.

PATENT NO.
2721641

LOS ANGELES

STEEL CASTING CO.

6100 So. Boyle Avenue, Los Angeles 38, California

dent. The acquisition is an outright purchase of the complete plant, certain product inventory, and major facilities of the Lebus Rotary Tool Works, Inc., manufacturer of drop forged tools. John McEvoy, a veteran American Hoist employee, will become general manager of the Texas plant.

Kaiser Steel appointment

Appointment of Harry L. Warner as sales manager for Kaiser Steel's Fontana fabricating division is announced. Before being named to his present position, he was sales engineer, then manager of contract sales at the Napa fabricating division.

John Mosling becomes Oskosh prexy

In a recent organization change of the Oshkosh Motor Truck, Inc., Oshkosh, Wis., B. A. Mosling was named chairman of the board and John P. Mosling was elected to succeed his father as president.

Wirt retires; Owen takes over

F. A. Wirt recently announced his retirement as advertising manager for J. I. Case Co., Racine, Wis. Wirt joined this tractor and machinery concern in 1922 and has been advertising manager since 1924. Leonard V. Owen was appointed to succeed him. Owen, widely known for his advertising, merchandising and sales

promotion talents, was associated with Klau-Van Pietersom-Dunlap Inc., before joining the Case Company. From 1946 to 1955 he worked for International Harvester Co. at the general offices in Chicago.

Garrison moves into new plant

Garrison Manufacturing Co., Inc., designers and manufacturers of hydraulic power steering equipment, is now operating from their new plant located on a one-acre site at 4609 R Sheila St., Los Angeles, Calif.

New Rocky Mountain branch mgr.

Ray M. Lucas has been named Rocky Mountain branch manager of the Nelson Stud Welding Division of Gregory Industries, Inc., with office at 1224 Walnut St., Denver, Colo. Lucas, who has been Nelson's field engineer in the Denver area for several years, will also be responsible for distributor relations in this region.

Merger proposed

The boards of directors of J. I. Case Co. of Racine, Wis., and of the American Tractor Corp., Churubusco (Fort Wayne), Ind., have approved plans for the merging of the two companies. The proposal will be submitted to the stockholders of both companies when details of the agreement are completed.

Sales personnel changes

Two veteran employees of Calaveras Cement Co., San Francisco, Calif., A. L. "Buck" Sundell and A. Maier, recently retired. Maier, associated with Calaveras since 1934, has been salesman in the Oakland territory since 1941. Sundell joined the company in 1935, and was North Coast sales representative with headquarters in Santa Rosa. Henceforth Calaveras will be represented in the East Bay territory by Jack Gordon and Sherman R. Locke, and by Jack L. Garvey and William J. Gray in the North Coast area.

New Northwest district office

W. P. F. Brawner, president of W. P. Fuller & Co., recently announced the establishment of a new Fuller district headquarters in Seattle, to cover Oregon, Washington, and Alaska. The former Puget Sound branch manager, C. E. Freeman of Seattle, is the new district manager.

Western expansion by Yale & Towne

Yale & Towne Manufacturing Co. has announced that it will construct a modern industrial lift-truck sales and service branch in Los Angeles as the first step in a widespread Western expansion plan. In announcing plans for the new facilities, now operating in temporary quarters pending completion of the new building, Paul R. Minich, Jr., materials handling general sales manager, predicted a 150% increase in demand for Yale products in the West in the next ten years.

(Advertisement)

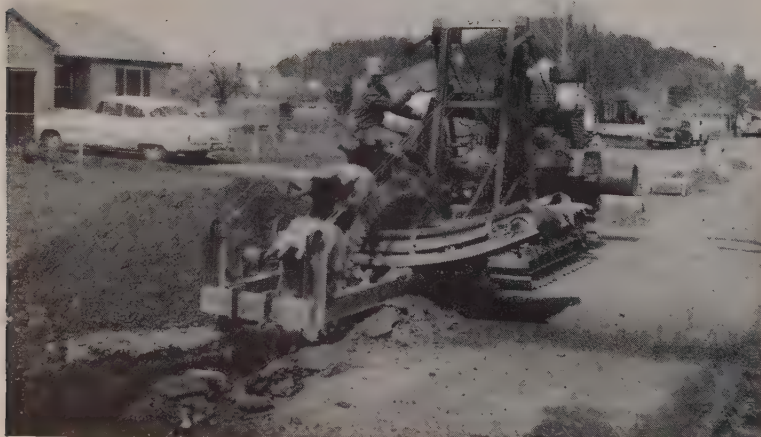
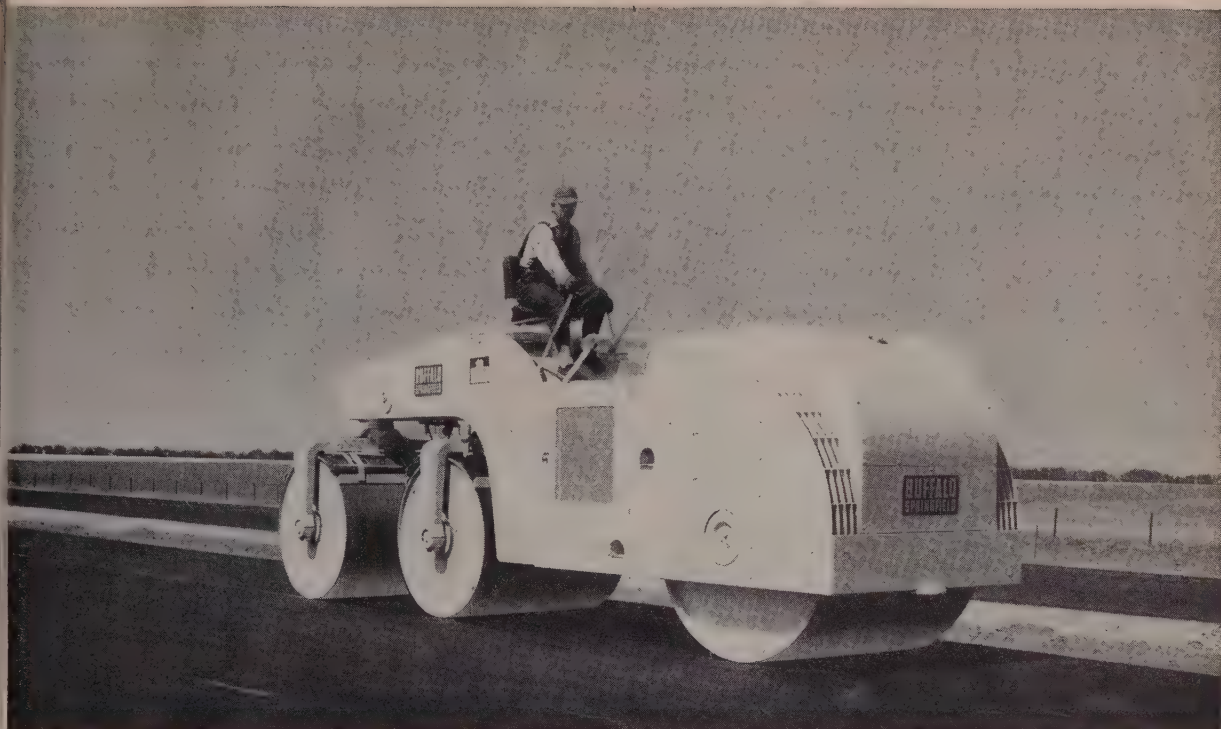


Photo and Report by Art Wintle, Portland, Oregon

NO OFF-THE-JOB DOWNTIME IN 3 YEARS. This husky Cleveland 95 trencher has not been off the job for major repairs over a period of three years of extensive use on sewer and water line excavating jobs for the City of Portland, Oregon. The dependable "Baby Digger" is shown here digging trench down the center of 74th Street for a water line of 8-inch pipe. Just another example of Cleveland's ability to *dig more trench . . . in more places . . . at less cost.* Talk it over with your Cleveland distributor.

THE CLEVELAND TRENCHER CO., 20100 St. Clair Avenue, Cleveland 17, Ohio



"EASIEST HANDLING ROLLER" ... says operator as Buffalo-Springfield "Walking Beam" 3-Axle Tandem compacts Kansas Turnpike for San-Ore Construction

San-Ore Construction Co., McPherson, Kansas, used this Buffalo-Springfield Heavy-Duty "Walking Beam" 3-Axle Tandem Roller with *Complete Compaction Control* to get 99% specified densities on Sections 1 and 2 of the Kansas Turnpike.

Said Earl Robinson, operator: "We're finishing $2\frac{3}{4}$ " asphalt down to $2\frac{1}{2}$ ", and this roller is doing a beautiful job. There's plenty of power, and the synchronized hydraulic steering makes it the easiest handling roller I've ever run."

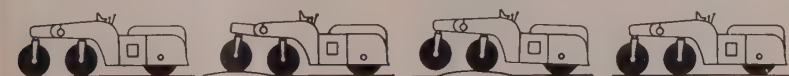
To which Charles Nickel, Superintendent, added: "This roller works and operates better than anything we have on the job."

Buffalo-Springfield's 3-Axle Tandem is *the best* 3-Axle Roller because

its exclusive "Walking Beam" design and construction permits complete compaction control. There is never an increase in compaction pressure except when and where it is needed ... on the high spots only! Then, through the "Walking Beam" semi-locked action almost 3 times the normal compaction pressure of the center roll may be applied to the high spots, providing a leveling action unequalled by any other type 3-axle tandem roller. No need for added cross-rolling time and expense, and consequently no possible damage to material that has been compacted and set. Another feature of the "Walking Beam" action is that all rolls can be released for full floatation whenever the leveling action is not desired.



Let your nearest Buffalo-Springfield distributor show you why anything less than a genuine Buffalo-Springfield 3-Axle Tandem with exclusive "Walking Beam" Compaction Control is old-fashioned! Ask or write for Bulletin No. S-71-1255.



BEAM, semi-locked. Lead guide roll can rise above but not go below its normal position.

FIRST guide roll encounters "hump" exerting only normal pressure, "prepares" material.

CENTER guide roll rises on "hump," lifts lead roll off ground, exerts triple normal weight.

DRIVE roll follows through with normal pressure. Beam can be locked and unlocked.

The Standard  of Comparison

**BUFFALO-SPRINGFIELD
ROLLER COMPANY**
SPRINGFIELD, OHIO

Appointments in top management

Two new management appointments were recently announced by A. J. Werner, president of Wagner Iron Works, Milwaukee, Wis. James G. Dean, formerly vice president in charge of sales, has been named vice president and assistant to the president. William J. Schlapman, formerly sales manager of Wagner's tractor loader division, has been promoted to vice president in charge of sales.

Pete Shrauger made Spokane rep

M. Pete Shrauger, a salesman for Bethlehem Pacific in the Northwest for the past seventeen years, has been made resident sales representative in Spokane, Wash., H. E. Gray, district sales manager, recently announced.

Shrauger succeeds C. T. Foxworth, resident representative since 1953, who is returning to Seattle to continue in sales work there.

Frank Shanahan transferred West

Frank Shanahan has been transferred to the West Coast as sales engineer for Continental Motors' industrial and transportation engines in the states of California, Oregon, Washington, Utah, Idaho and Nevada, and in British Columbia. His headquarters are at 4102 Beresford, San Mateo, Calif.

Kaiser Gypsum buys Fir-Tex

Kaiser Gypsum Co., Inc., Oakland, Calif., subsidiary of Permanente Cement Co., is purchasing the physi-

cal assets of Fir-Tex Insulating Board, Inc., in a multimillion dollar transaction, it was recently announced.

McComb represents Flexible Steel

Jim McComb, who has been traveling California for the past few years, will cover this state for Flexible Steel Lacing Co., manufacturer of Flex-



Jim
McComb

and Alligator belt fasteners for joining conveyor and transmission belts, also Rema materials for repairing conveyor belts. He takes over the area formerly covered by Newt Cruikshank, who is now vice president and sales manager of Holz Rubber Co., Inglewood, Calif.

Chrysler advances two

Two advancements in the West Coast regional office of Chrysler Marine & Industrial Engine Division, Chrysler Corp. are announced. C. C. Williams, vice president—sales, M. J. Yost has been named regional manager of the office, and J. J. Lapp has been selected Los Angeles representative. Prior to transferring to Los Angeles, Yost served as sales representative for Chrysler at Seattle, Wash. Lapp previously was engine and field service representative for Federal Motor Truck.

New sales district established

A new sales territory to be known as the San Francisco Sales District has been created by the Industrial Products Divisions of Hewitt-Robins Inc., Stamford, Conn. to handle the company's growing volume of business in the Northwest. Theodore Zinter has been named manager of the new district, which previously had been served by the Los Angeles office. He will be succeeded as manager of belt sales and development in Buffalo, N. Y., by Merrill H. Hickey.

New headquarters; new distributor

In the interest of greater space, A. C. Cope Co., San Francisco, recently moved to new headquarters at 435 Bryant St., where increased emphasis is being placed on the marketing of Stow Manufacturing Co. concrete equipment, and Darling Manufacturing Co.'s line of gate valves, in addition to other items for which Cope is direct factory representative. Recently appointed distributor for the Stow line of vibrators, screeds, trowels, etc. in San Francisco is A. R. Reid Co.

Advertisement



Symons Forms Help Speed College Job

Williams and Burrows, Inc., Belmont, California, contractors for the \$4,000,000 new buildings of the College of Holy Names, selected Symons Forms with steel cross members to help speed construction. Symons Forms were used in many places where ordinary forms were not adaptable. Other important reasons for using Symons Forms are that they can be erected and stripped fast, and can be used again and again.

Let us provide you with further details on how Symons Forms and Service can help you save on your forming costs. Send us the plans for your next job . . . our engineers will prepare a complete form layout, bill of materials, and make recommendations for the most efficient method of forming.

Symons Forms can be rented with purchase option. Symons Clamp & Mfg. Co., 634 Williams Street, San Leandro, California.

PREFERRED by CONTRACTORS

Less initial cost—Lower upkeep

MARVEL CONCRETE VIBRATORS

GV-1, GV-2 & GV-3 Models Now Equipped
with Automatic Centrifugal Clutch as
Standard Equipment.
Interchangeable Flexible Shafts.

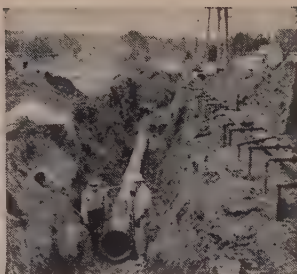
Write for full information

MARVEL EQUIPMENT CORPORATION
215-217 EAGLE ST. • B'KLYN 22, N. Y.

1 1/2 HP to
5 HP

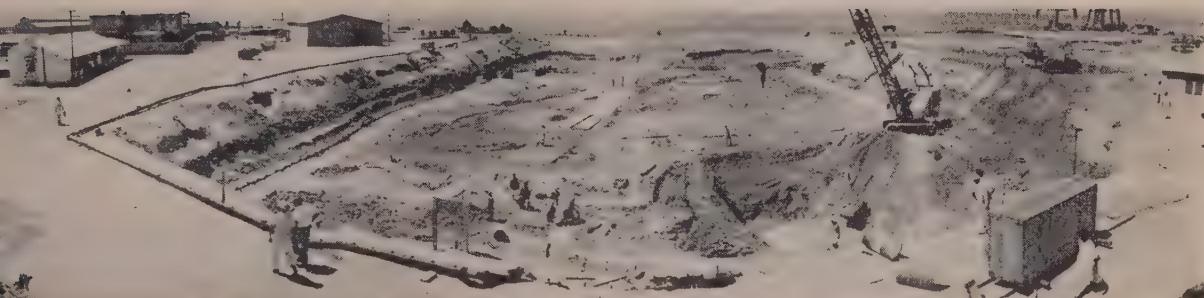


*
In the State of Washington heavy rainfall maintains a very high water table yet the Stang wellpoint installation and supervision kept a 6½-foot x 9-foot nearly vertical walled trench completely dry.



FROM PUYALLUP*

TO PAKISTAN...



STANG KEEPS WET JOBS DRY!

Water is where you find it...but, in the construction business, all too often you find water where you don't want it. That's when the Stang dewatering services and equipment can help you—whether your water problem is in Puyallup, Pakistan, or on your own job.

Whatever your water handling job calls for—call Stang. Nationwide depots and an experienced foreign service are on constant standby to put your job on a sound, dry footing.

Don't risk delay on your job; choose the right method the first time—call in our Representative. He will supply you with a thorough and accurate analysis of your problem and the Stang recommendation for a speedy, economical solution.



This 150-foot by 400-foot drydock in Karachi, Pakistan, being built for the Pakistan Industrial Development Corp. (Swiss-boring Overseas Corp., Ltd., Contractor) called for an excavation 40 feet deep with a 32-foot water table—only 50 feet from the water's edge! Dewatering of the job was quickly and efficiently accomplished by a specially engineered installation of Stang wellpoints, supervised by a Stang field engineer. Just one more example of Stang's outstanding water handling services to contractors the world over.

Write for bulletin 100-D

Putting water
in its place



JOHN W. STANG CORPORATION

Engineers and Manufacturers of Dewatering Equipment, Wellpoint and Pumping Systems
Dewatering Planning—Equipment—Service

BELL, CALIFORNIA
8221 Atlantic Avenue
Telephone: LUdlow 2-7421

OMAHA, NEBRASKA
2123 South 56th Street
Telephone: Walnut 7796

TACOMA, WASHINGTON
2339 Lincoln Avenue
Telephone: Broadway 4362

TULSA, OKLAHOMA
4026 South Urbana Street
Telephone: Riverside 2-6929

UNIT PRICES

Selected abstracts for Western projects

CANAL—Earthwork, structures and wasteway drainage system in Washington.

Washington—Columbia Basin Project—Bureau of Reclamation. Cherf Brothers, Inc., and Sandkay Contractors, Inc., received a \$293,371 contract for earthwork, structures and wasteway drainage system for East Low Canal wasteways on the Columbia Basin Project.

(1) Cherf Brothers, Inc., and Sandkay Contractors, Inc.	\$293,371
(2) Lewis Construction Co.	300,832
Lewis Hopkins Co.	308,959
Erland and Bickle.	310,451

	(1)	(2)
105,000 cu. yd. Excavation for wasteways and spillways	\$.46	\$.30
26,000 cu. yd. Excavation for structures	.46	.65
109,000 cu. yd. Compacting embankments	.15	.20
9,300 cu. yd. Backfill about structures	.30	1.70
9,300 cu. yd. Compacting backfill about structures	2.35	1.70
85,000 cu. yd. Excavation from borrow	.25	.25
5,000 cu. yd. Riprap	4.60	3.30
2,300 cu. yd. Sand and gravel bedding for riprap	3.50	2.90
2,100 cu. yd. Rock backfill	4.60	2.50
26 lin. ft. Furnishing and laying 8 in. dia. sewer pipe drains with cemented joints	2.00	11.00
240 lin. ft. Furn. and lay. 60 in. No. 10 gage, corr-met. pipe	25.00	26.00
264 lin. ft. Furn. and lay. 84 in. No. 8 gage, corr-met. pipe	42.00	42.00
104 lin. ft. Furnishing and laying 48 in. dia. HE125 concrete pressure pipe with type "R" joints	44.00	47.00
100 lin. ft. Furnishing and laying 54 in. dia. HE125 concrete pressure pipe with type "R" joints	50.00	52.00
1,140 cu. yd. Concrete in structure	62.00	74.00
1,700 bbl. Furnishing and handling cement	6.00	7.00
141,000 lb. Furnishing and placing reinforcement bars	.16	.18

HIGHWAY—Road construction in Utah

Utah—Cache County—State. LeGrand Johnson Construction Co. received a \$141,076 contract for grading and paving of 5.959 mi. of highway near Richmond, Utah.

(1) LeGrand Johnson Construction Co.	\$141,076
(2) Jack B. Parson Construction Co.	145,845
Olof Nelson Construction Co.	148,015
The Contracting Corp.	172,856

	(1)	(2)
526 ton Bituminous material Type MC-3	\$ 32.50	\$ 32.00
121 ton Bituminous material Type MC-1 or MC-2	33.00	32.00
79 ton Bituminous material Type RC-4	35.00	33.00
183 gal. Bituminous additive	2.00	3.00
5,959 mi. Scarifying & mixing	700.00	700.00
920 ton Cover material type "A"	3.00	3.50
920 ton Cover material type "A" (in stockpile)	1.75	2.50
25,500 ton Gravel surface type "B"	.77	.78
35,300 cu. yd. Selected material base course	.70	.65
52,000 cu. yd. Unclassified "roadway" excavation	.25	.24
33,000 cu. yd. Imported borrow	.25	.24
273,000 sta. yd. Class "A" overhaul	.015	.02
11,000 yd. mi. Class "B" overhaul	.13	.20
2,400 M gal. Watering	1.25	1.50
680 hr. Rolling, tamping roller	9.00	12.00
190 hr. Rolling, pneumatic tire or power roller	6.00	10.00
341 lin. ft. 12 in. C.M. pipe	2.60	2.70
130 lin. ft. 18 in. C.M. pipe	3.15	3.20
454 lin. ft. 24 in. C.M. pipe	3.65	3.50
381 lin. ft. 24 in. C.M. pipe	5.55	5.50
158 lin. ft. 48 in. C.M. pipe	15.40	13.50
20 lin. ft. C.M. pipe—arches 22 x 13 in.	4.00	3.70
44 lin. ft. C.M. pipe—arches 29 x 18 in.	5.90	6.00
60 lin. ft. C.M. pipe—arches 43 x 27 in.	11.00	11.00
24 lin. ft. 15 in. reinforced concrete pipe	3.75	3.50
51 lin. ft. 18 in. reinforced concrete pipe	4.25	4.10
200 lin. ft. 8 in. underdrain	1.50	1.00
154 lin. ft. 36 in. C.M. pipe	10.50	10.00
250 lin. ft. 8 in. welded steel pipe	2.70	3.00
5 cu. yd. Concrete Class "A"	75.00	60.00
2 cu. yd. Concrete Class "AA"	100.00	65.00
850 lb. Reinforcing steel	.20	.16
1,200 cu. yd. Excavation for structures, unclassified	1.50	1.00
1,200 cu. yd. Small ditch excavation	.50	1.00
80 hr. Mechanical tamping	5.00	6.00
70 ea. Right-of-way markers	5.00	8.00
129 ea. Guide posts	6.00	8.00
2 ea. Railroad crossing signs	400.00	1,000.00
Lump sum Clearing & grubbing	1,000.00	1,500.00

HIGHWAY—Grading, draining and surfacing in Wyoming

Wyoming—Lincoln County—State. A \$160,733 contract was awarded to Rissler & McMurrey Co., Inc., for grading, draining, base coat surfacing, sand gravel seal coat and miscellaneous work on 4.692 mi. of road.

(1) Rissler & McMurrey Co., Inc.	\$160,733
(2) Woodward Construction Co.	163,284
Huntley Construction Co.	166,666
L. H. Weber Construction Co.	170,228

	(1)	(2)
229,000 cu. yd. Excavation	\$.21	\$.2
24,600 cu. yd. mi. Cubic yard mile haul	.20	.1
10,400 ton Selected material surfacing, Type 1	.75	.6
31,400 ton Special embankment	.33	.3
740 hr. Sheep's foot roller operation	11.00	11.00
80 hr. Equipment roller operation	13.00	12.00
964 lin. ft. 24 in. C.M.P.	6.50	6.00
338 lin. ft. 30 in. C.M.P.	8.00	8.20
84 lin. ft. 36 in. C.M.P.	12.00	12.00
70 lin. ft. 42 in. C.M.P.	14.00	15.00
120 lin. ft. Relaying pipe	3.50	2.0
200 cu. yd. Excavation for pipe culverts	2.00	2.5
300 hr. Mechanical tamping	7.00	8.0
100 cu. yd. Class 1 riprap	15.00	20.00
50 cu. yd. Grouted riprap	20.00	25.00
100 cu. yd. Subexcavation	3.00	2.0
200 lin. ft. 8 in. perforated corrugated metal pipe	2.00	2.4
45 cu. yd. Excavation for drains	3.00	3.30
60 cu. yd. Gravel for drains	5.00	8.0
9,800 ton Crushed gravel base course (¾ in. max.)	.85	.7
530 ton Crushed sand-gravel	5.00	4.0
6,530 M gal. Watering	1.60	1.5
15 hr. Smooth steel roller operation	20.00	10.0
110 hr. Pneumatic tired roller operation	6.50	6.5
122,400 ton mi. Haul of surfacing material	.15	.1
120 ton Asphaltic material MC-Prime	44.00	36.00
60 ton Asphaltic material RC-Seal	45.00	38.00

HIGHWAY—10 mi. of road construction in New Mexico.

New Mexico—De Baca County—State. A \$138,184 contract was awarded to Haake Construction Co. for grading and surfacing 10.634 mi. of highway in New Mexico.

(1) Haake Construction Co.	\$138,184
(2) G. I. Martin	141,350
Harry Trotz	187,981

	(1)	(2)
lump sum Removal of obstructions	\$800.00	\$150.00
5,163 lin. ft. Removing & rebuilding fence	.15	.22
77,550 cu. yd. Excavation—unclassified	.33	.33
650 cu. yd. Excavation for pipe culverts	2.00	2.00
6,530 M gal. Watering	1.50	.5
220 hr. Rolling (pneumatic tired)	6.00	4.5
180 hr. Rolling (tamping roller)	6.00	10.0
65 hr. Rolling (steel tired)	8.00	7.0
660 hr. Fifty (50) ton roller operation	8.00	10.0
120 hr. Mechanical tamping	8.00	6.0
131,600 sta. yd. Station yard haul	.01	.0
15,158 ¼ mi. yd. Quarter mile yard haul	.07	.0
5,32 mi. Grading	1,700.00	1,700.00
8,200 lin. ft. Contour ditches	.08	.1
5 ea. Cattle guard—24 in. roadway	2,400.00	2,000.00
3,666 lin. ft. Galvanized barbed wire fence	.22	.22
6 ea. Gates—Texas type	5.00	10.0
22 ea. Bracing	8.00	10.0
74 ea. Right-of-way markers	6.00	9.0
2 ea. Stand. Fed. aid project markers, type I	50.00	50.0
47,300 ton Base course	.88	1.0
259 cu. yd. Class "B" concrete for cut-off walls	41.00	45.0
13 cu. yd. Grouted rock retards	25.00	20.0
1,276 lin. ft. 18 in. rise	6.00	5.0
342 lin. ft. Corr. metal pipe arch culv. 36 in. span x 22 in. rise	7.00	6.0
184 lin. ft. Corr. metal pipe arch culv. 43 in. span x 27 in. rise	10.00	10.0
56 lin. ft. Corr. metal pipe arch culv. 50 in. span x 31 in. rise	12.00	12.0

HIGHWAY—Construction of 6.75 mi. of highway in Washington.

Washington—Wahkiakum County—State. Warren Northwest, Inc., was awarded a \$176,034 contract for 6.75 mi. of grading and paving in Washington.

(1) Warren Northwest, Inc.	\$176,034
(2) Pacific Sand & Gravel Co.	212,084

	(1)	(2)
lump sum	\$4,800.00	\$2,500.00
4,700 cu. yd.	Com. excav. incl. haul.	1.50 .40
10 cu. yd.	Com. trench excav. incl. haul.	5.00 3.00
100 cu. yd.	Structure excavation.	4.00 3.00
1 unit	Furnish smooth wheeled power roller.	150.00 250.00
1 unit	Furnishing pneu. tired roller.	175.00 250.00
12 day	Operating smooth wheeled power roller.	60.00 65.00
9 day	Operating pneu. tired roller.	75.00 65.00
1 day	Mechanical tamper.	40.00 65.00
1,000 lin. ft.	Slope treatment, Class "B".	.20 .15
406 sta.	Finishing roadway.	10.00 10.00
220 M gal.	Water.	2.50 3.00
75 cu. yd.	Gravel backfill for drains.	7.50 8.00
2,600 ton	Furnishing & placing ballast.	3.40 4.50
7,030 ton	Crushed stone surf. top crse. from stockpile	.80 1.10

LIGHT BITUMINOUS SURFACE TREATMENT METHOD A

170 ton	Asphalt cement MC-3.	42.00 55.00
1,530 cu. yd.	Placing crushed cover stone from stockpile	2.00 2.00
	Type I—1 asphaltic concrete pavement.	
8 mi.	Prep. of untreated roadway.	250.00 300.00
1,240 cu. yd.	New fine mineral aggregate.	2.00 2.00
115 ton	Asphalt cem. MC-3 prime coat.	42.00 55.00
6,720 ton	Class "C" wearing course.	4.95 6.15
14,550 ton	Class "L" leveling course.	4.95 6.15
2,180 cu. yd.	Furnishing blending sand.	2.00 4.00
135 ton	Furnishing min. filler.	16.00 25.00
20 ton	Asphalt cem. for tack coat.	50.00 55.00

OTHER ITEMS

1 cu. yd.	Conc. Class "C".	75.00 100.00
46 cu. yd.	Conc. Class "E".	43.00 38.00
11,920 lb.	Steel reinforcing bars.	.12 .15
lump sum	Illumination system complete.	
160 lin. ft.	Asphaltic conc. traffic bars.	1.00 2.00
195 lin. ft.	Plain conc. or V.C. drain pipe 8 in. dia.	1.50 1.50
27 lin. ft.	Plain conc. culv. pipe 18 in. dia.	4.00 3.00
33 ea.	Mon. cases & covers.	30.00 35.00
78 lin. ft.	Standard beam guard rail.	3.50 4.00
600 ea.	Guide posts.	3.00 4.50
9 ea.	Reinf. conc. roadway markers.	15.00 7.00
376 lin. ft.	Removing temporary beam guard rail.	.50 1.50
7,030 sq. yd.	Scarifying existing bit. surf.	.05 .25
est.	Flagging.	750.00 750.00

HIGHWAY—Construction of 6.5 mi. of highway in New Mexico

New Mexico—Torrance County—State. A \$572,160 contract was awarded to G. I. Martin, O. D. Cowart and E. M. Silver for construction of 6.586 mi. of highway and bridge in New Mexico.

(1) G. I. Martin, O. D. Cowart & E. M. Silver.	\$572,160
(2) Skousen-Hise Contracting Co.	628,388
Wayne A. Lowdermilk, Inc.	629,982
Brown Contracting Co.	664,239

	(1)	(2)
Lump sum	\$14,800.00	\$12,500.00
243,455 cu. yd.	Excavation—unclassified.	.61 .53
1,240 cu. yd.	Excavation for structures.	2.00 2.00
2,501 cu. yd.	Excavation for pipe culverts.	2.00 2.00
95,404 cu. yd.	Ordinary borrow.	.30 .30
20,035 M gal.	Watering.	.10 .50
490 hr.	Rolling (tamping roller).	5.00 7.00
795 hr.	Rolling (pneumatic tired).	4.00 2.50
285 hr.	Rolling (steel tired).	7.00 4.00
1,720 hr.	Fifty (50) ton roller operation.	5.00 7.00
649 hr.	Mechanical tamping.	6.00 2.00
546,974 sta. yd.	Station yard overhaul.	.02 .02
272,600 ¼ mi. yd.	Quarter mile yard haul.	.05 .05
277,420 ton mi.	Ton mile haul.	.05 .07
4.2 mi.	Obliterating old road.	500.00 300.00
3,600 lin. ft.	Contour ditches.	.20 .10
102 cu. yd.	Mortar rubble masonry.	30.00 60.00
2 ea.	Cattle guard—12 ft. roadway.	1,200.00 1,400.00
1 ea.	Cattle guard—18 ft. roadway.	1,800.00 2,000.00
49,290 lin. ft.	Galvanized barbed wire fence.	.24 .30
9 ea.	Gates—standard type.	50.00 50.00
83 ea.	Bracing.	10.00 7.00
1,115 lin. ft.	Galvanized woven wire farm fence.	.30 .30
69 ea.	Right-of-way markers.	9.00 6.00
1 ea.	Std. Fed. aid proj. markers, Type I	100.00 50.00
127 ea.	Treated tmbr. warn. posts, refl. (6 in. diam.)	7.00 7.00
56,725 ton	Controlled gradation sub-base.	.80 .68
32,740 ton	Base course.	.95 1.23
1,458 bbl.	Bituminous material, Type MC-1.	7.00 6.50
2,547 bbl.	Bituminous material, Type 120-150	7.50 7.00
4,577 ton	Cover material.	3.50 4.25
382 cu. yd.	Class "A" concrete.	55.00 75.00
151,390 lb.	Reinforcement for concrete struct.	.14 .17
10 cu. yd.	Grouted rock retards.	25.00 30.00
1,080 lin. ft.	Culvert pipe—24 in. diam.	5.10 6.00
536 lin. ft.	Culvert pipe—30 in. diam.	6.55 7.50
592 lin. ft.	Culvert pipe—36 in. diam.	9.50 10.00
966 lin. ft.	Culvert pipe—42 in. diam.	11.55 11.65
184 lin. ft.	Culvert pipe—42 in. diam. (10 gage or extra strength).	14.25 15.00



Put your bloodhounds in the dog house

You won't need them. For it doesn't matter what you want, you'll find it fast in the Yellow Pages. From raw materials to any specialized service you require . . . the Yellow Pages will tell you where to call. So look in the Yellow Pages whenever any problem comes up in your business. The chances are you'll find a complete list of qualified people anxious to help you out.

You'll find it fast in the YELLOW PAGES



228 lin. ft.	Culvert pipe—48 in. diam.....	12.90	18.00	88 cu. yd.	Concrete class "A".....	80.00	78.00
228 lin. ft.	Culvert pipe—54 in. diam.....	14.25	21.00	3 cu. yd.	Concrete class "AA".....	100.00	100.00
92 lin. ft.	Culvert pipe—60 in. diam.....	20.35	30.00	15,300 lb.	Reinforcing steel.....	.15	.16
70 lin. ft.	Culvert pipe—66 in. diam.....	22.40	34.00	1,750 cu. yd.	Excavation for structures, unclassified..	2.00	2.00
148 lin. ft.	Culvert pipe—84 in. diam.....	33.60	47.00	1,150 cu. yd.	Small ditch excavation.....	.70	.60
100 lin. ft.	Corr. galv. metal pipe encasement— 12 in. diam.....	4.00	7.00	349 ea.	Guide posts.....	6.50	7.00
BRIDGE ITEMS				136 ea.	Right-of-way markers.....	6.50	6.50
166 cu. yd.	Excavation for structures (bridges).....	5.00	4.00	23,100 lin. ft.	Right-of-way fence type "B".....	.30	.32
552 cu. yd.	Wire enclosed riprap.....	7.00	10.00	4 ea.	12 ft. gates (2-24 ft. openings).....	35.00	37.50
10,208 lb.	Wire fabric for riprap.....	.30	.30	2 ea.	14 ft. gates.....	40.00	40.00
151 cu. yd.	Excavation for riprap.....	2.00	3.00	14 ea.	16 ft. gates.....	50.00	45.00
420 lin. ft.	Steel stakes for riprap.....	2.00	2.50	225 hr.	Mechanical tamping.....	5.00	6.00
363.26 cu. yd.	Class "A" conc-bridge superstruct.....	65.00	100.00	2,000 lin. ft.	Surface ditches.....	.15	.15
154.56 cu. yd.	Class "A" conc-bridge substructure.....	60.00	100.00	lump sum	Clearing & grubbing.....	2,500.00	3,000.00
76.87 cu. yd.	Class "C" concrete (piling).....	35.00	60.00	4 ea.	F.A.P. markers.....	25.00	25.00
29,514 lb.	Structural steel.....	.35	.40	lump sum	Furnishing Water equipment.....	500.00	1,000.00
328 lin. ft.	Digging pile holes.....	8.00	12.00	lump sum	Furnishing construction signs.....	500.00	1,500.00
2,649 lin. ft.	Closed-end steel pipe piles.....	7.00	10.00				

HIGHWAY—Grading and bituminous surfacing in Utah

Utah—Rich County—State, LeGrand Johnson Construction Co., Inc., submitted a low bid of \$301,707 for construction of 10.228 mi. of road mixed bituminous surface road near Meadowville, Utah.

(1) LeGrand Johnson Construction Co, Inc.....	\$301,707
(2) Germer, Abbott & Waldron.....	304,191
Jack B. Parson.....	314,167
W. W. Clyde & Co.....	327,791

	(1)	(2)
865 ton	Bituminous material, Type MC-3.....	\$ 35.00 \$ 32.75
198 ton	Bituminous mat., Type MC-1 or MC-2.....	35.40 34.00
131 ton	Bituminous material, Type RC-4.....	37.00 35.00
304 gal.	Bituminous additive.....	2.50 2.50
10,228 mi.	Scarifying & mixing.....	750.00 700.00
1,520 ton	Cover material, Type "A".....	4.00 3.50
1,520 ton	Cover material, Type "M" (in stockpile).....	2.50 2.00
51,300 ton	Gravel surface, Type "B".....	.78 .71
78,000 ton	Gravel base course.....	.65 .63
117,000 cu. yd.	Unclassified "roadway" excavation.....	.30 .36
67,000 cu. yd.	Imported borrow.....	.30 .28
513,000 sta. yd.	Class "A" overhaul.....	.01 .015
48,000 yd. mi.	Class "B" overhaul.....	.14 .15
4,490 1000 gal.	Watering.....	1.25 1.25
1,400 hr.	Rolling, tamping roller.....	9.00 8.00
265 hr.	Rolling, pneumatic tire or power roller.....	7.00 9.00
318 lin. ft.	15 in. C.M. pipe.....	3.00 3.25
718 lin. ft.	18 in. C.M. pipe.....	3.60 3.90
2,130 lin. ft.	24 in. C.M. pipe.....	5.50 5.50
744 lin. ft.	30 in. C.M. pipe.....	6.70 7.00
148 lin. ft.	48 in. C.M. pipe.....	14.40 15.00
32 lin. ft.	84 in. C.M. pipe.....	46.75 49.00
538 lin. ft.	C.M. pipe arches 22 in. x 13 in.....	3.80 4.00
698 lin. ft.	C.M. pipe arches 29 in. x 18 in.....	5.70 5.90
48 lin. ft.	C.M. pipe arches 36 in. x 22 in.....	7.00 7.25
52 lin. ft.	C.M. pipe arches 58 in. x 36 in.....	15.40 16.00
76 lin. ft.	C.M. pipe arches 65 in. x 40 in.....	17.80 20.00
44 lin. ft.	C.M. pipe arches 72 in. x 44 in.....	24.15 35.00
46 lin. ft.	12 in. C.M. pipe (perforated).....	3.00 2.70

HIGHWAY—Grading, draining and surfacing in Wyoming

Wyoming—Lincoln County—State. A low bid of \$205,253 was submitted by W. E. Barling, Inc., for roadwork on 0.913 mi. of the Afton streets in Lincoln County.

(1) W. E. Barling, Inc.....	\$205,253
(2) Big Horn Construction Co.....	236,464

	(1)	(2)
34,600 cu. yd.	Excavation.....	\$.90 \$ 1.00
13,400 cu. yd. mi.	Cubic yard mile haul.....	.25 .25
970 M gal.	Watering.....	2.00 2.00
120 hr.	Pneumatic tired roller operation.....	7.00 7.00
200 hr.	Smooth steel roller operation.....	7.00 10.00
180 hr.	Mechanical tamping.....	7.00 12.00
36,500 ton	Special embankment.....	.60 .85
8,500 cu. yd.	Stripping.....	.40 .29
85,400 ton mi.	Haul of surfacing material.....	.15 .10
140 cu. yd.	Excavation for pipe culverts.....	3.00 5.00
230 cu. yd.	Sewer excavation.....	3.00 3.50
11,500 ton	Crushed grav. base crse. (2 in. max.) grad. A.....	.60 1.25
8,600 ton	Crushed gravel base course (1 in. max.).....	.90 1.40
60 ton	Asphaltic material MC-Prime.....	47.00 40.00
30 ton	Asphaltic material RCF-Seal.....	51.00 40.00
10 ton	Asphaltic material tack coat.....	51.00 40.00
460 ton	Asphaltic material AC (85-100).....	40.00 33.00
2,850 ton	Plant mixed base course.....	5.60 6.00
4,700 ton	Plant mixed surface course.....	6.00 7.00
300 ton	Crushed sand-gravel.....	4.00 6.00
12 lin. ft.	18 in. standard R.C.P.....	12.00 6.00
1,130 lin. ft.	22 in. x 13 in. C.M.P. arch culverts.....	6.00 5.00
192 lin. ft.	29 in. x 18 in. C.M.P. arch culverts.....	8.00 8.00
242 lin. ft.	50 in. x 31 in. C.M.P. arch culverts.....	18.00 19.00
10 ea.	22 in. x 13 in. C.M.P. arch culv. end section.....	26.00 45.00
2 ea.	29 in. x 18 in. C.M.P. arch culv. end section.....	34.00 65.00
2 ea.	50 in. x 31 in. C.M.P. arch culv. end section.....	100.00 145.00
124 lin. ft.	8 in. V.C.C.P. (split).....	1.50 10.00
7,550 lin. ft.	Curb—Type A, (12½ in.).....	1.50 2.00
1,617 lin. ft.	Comb. curb & gutter-Type A (2 ft.—6 in.).....	3.15 4.00
10 sq. yd.	Concrete double gutters.....	6.50 15.00
1,260 sq. yd.	Concrete median paving.....	6.50 6.00
3 ea.	Manholes—Type A.....	450.00 600.00
5 ea.	Drop inlets—Type A.....	250.00 600.00
2 ea.	Drop inlets—Type B.....	250.00 450.00

Notice to publisher of CHANGE OF ADDRESS

NAME _____ Date _____

FROM
(Old address)

Street or P. O. Box Number

City

Zone

State

TO
(New address)

Street or P. O. Box Number

City

Zone

State

Company _____

Mail to: WESTERN CONSTRUCTION
609 Mission St.
San Francisco 5, California
Attn: Circulation Department

Position _____

