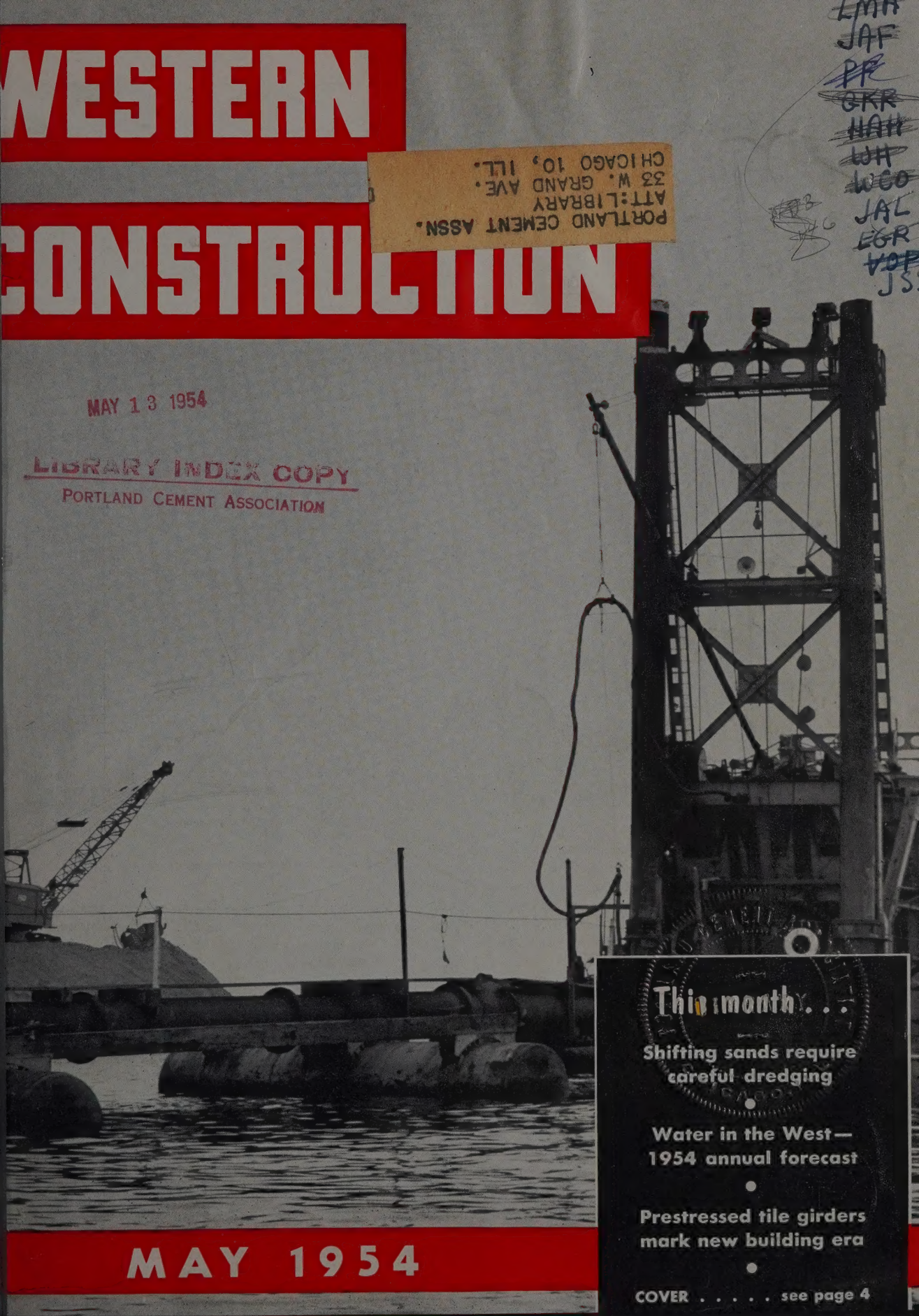
WESTERN CONSTRUCTION



This month . . .

Shifting sands require careful dredging

Water in the West—1954 annual forecast

Prestressed tile girders mark new building era

COVER . . . . . see page 4

MAY 1954

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WESTERN CONSTRUCTION

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FRONT COVER

SHELTERED by a protective levee (constantly maintained by dragline), the 27-in. dredge *Los Angeles* pokes its nose into open sea to perform dredging operation for the Corps of Engineers at Port Hueneme along Southern California coast. For full story of this operation, see page 54.

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Editorials

Building for business' sake

There is more than construction feasibility in many of today's field decisions by construction superintendents on major projects. Where the course of action on a job used to be decided exclusively on the basis of weather, materials delivery dates, labor availability, etc., new elements have entered the picture. "Strictly business" considerations, such as tax matters, were once important only at the high level of management. Today they have moved out on the job.

The development is a phase of a natural evolutionary process, and is another indication that the contracting industry is coming of age. Economic pressures have hastened the day of this pervading business awareness. These are highly competitive times, and to meet them contractors are exhibiting remarkable flexibility. The cynic would say they are presenting a moving target! The industrialist would say (with approval) that they are practicing diversification.

Among Westerners diversification on a geographical basis is nothing new. For years they have crossed state lines—and topographic contours—in the Western region, balancing their operations between year-around work and summer-only projects.

The new look is to be found in added types of work undertaken, such as heavy contractors taking on wholesale residential community development. Also, the joint venture has been extended in its application. Once it was a Western innovation necessary to match the scope of Western projects. Today, even on fairly small jobs, it is a business technique for spreading the risk.

The picture is an exhilarating one, for it signifies progressive thinking. At the same time, it is hard on one's notions of tradition. There has always been the sentimental idea that the West's big boys lived only for their many records of dirt yardage moved, of tunnel advance, of concrete placement. This might be termed building for building's sake. It is somehow difficult to realize that they are, after all, building for business' sake.

Tourist travel deserves traffic study

Tourist travel on the highways of the West has never had its full impact appraised by state highway departments. This applies not only to a consideration of the adequacy of the routes themselves for such traffic, but also the secondary effects on the state's economy from this "vacation industry."

The Arizona Highway Department, in cooperation with the Bureau of Public Roads and the National Park Service, has such a study in progress with a preliminary report on the Grand Canyon National Park area.

Because the winter season was under study, only South Rim traffic was surveyed. During a one-week period in February questionnaires were distributed among motorists, and information accumulated on route traveled, primary purpose of trip, number of persons in car, overnight accommodations used by travelers before and after the park visit, states of origin and eventual destination, mileage driven in park and on entire trip, and estimated expenditures of visitors.

Interpretations can be as complex as they should be useful. The information could be of tangible value to all cooperating agencies. Although the importance of the tourist to Western states has never been underestimated, highway departments have not actively interested themselves in the proper evaluation of tourist travel within state boundaries. That is to say, the out-of-state identity of highway users has been secondary to the matter of traffic pattern alone. Results of the current studies in Arizona may come to be reflected in that state's system of highway sufficiency rating. Where a primary economic function of a state, and of its highways, is catering to tourists, this is not inconceivable.

The annual inventory of water

Again, *Western Construction* presents the annual forecast of stream run-off in the West. No set of figures has more engineering or construction importance to this region. The cumulative record represents the basis for the conservation program and storage works of tomorrow, and the annual prediction can guide today's program of a contractor working in a river bottom behind cofferdams. Vagaries of spring weather will set the pattern for the daily and weekly flow that must be controlled and released through reservoirs with great skill to secure maximum benefits. From this regulation comes the power and water supply for irrigation and municipal use that permits the West to continue its phenominal growth. This annual forecast, therefore, is the measure of today's supplies and tomorrow's new projects.

WESTERN CONSTRUCTION

MAY 1954

VERMILION DAM: high altitude and high speed

. . . are features of Southern California Edison's newest dam construction in the Big Creek hydro system—Two short seasons require high mechanization by Bechtel Corp.—1953 review shows how it's done

By H. A. BARBER
Construction Engineer
Southern California Edison Co.

SHALLOW CUTS over large areas have characterized borrow-pit operations at the site of Vermilion Valley Dam, latest unit in the Southern California Edison Co. scheme for development of hydroelectric resources in the San Joaquin River watershed of California. Vermilion Dam is a 4,800,000-yd. embankment being built on a two-season schedule adopted by the contractor-engineer, Bechtel Corporation.

Four borrow pits being tapped for the work total about 1 sq. mi., but they are scattered over flat areas within the reservoir site at distances ranging up to 3 mi. from the embankment. The deposits are described as glacifluvial, with impervious silty sands near the surface only. So core material has been "skimmed" off a wide area. At greater depths are found the coarser sands and gravels, with their much higher permeabilities.

To get embankment material out in quantity—up to 600,000 cu. yd. in one month last September—the decision was to build broad, high-speed haul roads. The terrain was easy, and the operation has been a natural for the fleet of 15 Caterpillar DW20 units and 8 Kenworth 14-yd. trucks used in the hauling operation. Equipped with overdrive transmissions, the DW20's have rolled at 35 mph., loaded, on the level sections of road.

Vermilion Dam is situated at high elevation (7,500 ft.), and it is isolated; the only road serving the project rises to el. 9,300 in Kaiser Pass. Heavy snows normally blanket the site from November to April, limiting the working season to only 6 or 7 months. To finish the job in two such short seasons required careful scheduling and the selection of equipment to insure the greatest possible production. The high-speed units employed for hauling embankment material are typical of the fleet of heavy equipment purchased by Bechtel for delivery at the start of the job.

The dam is a conventional earthfill structure with a crest length of 4,230 ft. and a maximum height of 160 ft. above streambed. The 4,800,000 cu. yd. of embankment consists of a central impervious core supported and retained by extensive pervious envelopes and is founded on the glacial till and glacifluvial overburden. Under the upstream envelope lies an impervious blanket, to develop increased control of underseepage. Varying in thickness from 13 ft. to 5 ft., it extends a maximum of 1,300 ft. from the core into the adjacent reservoir area. An exception is a section to the east of the stream channel. Here the existence of an underlying impervious silt layer made it possible to terminate the blanket in a cutoff trench just outside the upstream toe by tying it into the silt layer.

Clearing began in May 1953

Actual construction on the dam began in May 1953 with clearing operations at the site. The first earthmoving equipment came on the job around

Where and what it is

ON NOVEMBER 10, 1953, a final scraper load of embankment placed in Vermilion Valley Dam marked the conclusion of the first season's work of a two-season schedule to build this earthfill structure, high in the Sierra Nevada, 90 road miles northeast of Fresno, Calif.

The first major earthfill dam in the Southern California Edison Co. hydroelectric system is located across Mono Creek at the lower end of a fairly broad, 4-mi. long glacial valley known as Vermilion Valley. Mono Creek is a major tributary of the south fork of the San Joaquin River, with an average annual discharge of approximately 114,000 acre feet.

Investigation of this area for the possibility of constructing a dam was initiated in 1924. Extensive exploratory drilling indicated a substantial mantle of glacial silt and glacifluvial deposits overlying granite bedrock.

In 1927 a streamflow diversion was constructed 1½ mi. downstream from Vermilion damsite, whereby the normal flows of Mono Creek were directed through a system of tunnels and pipeline conduits into Ward Tunnel and Huntington Lake. From Huntington Lake this water, together with other important diversions, starts a 6,000-ft. descent through a series of 5 powerhouses in the Big Creek system.

During subsequent years the Vermilion Project was shelved for economic reasons. Early in the 1940's, however, engineering studies were resumed which led to the decision to build an earthfill structure. The dam, when completed, will create a reservoir with a capacity of 125,000 acre feet. This will make it possible to store the surplus which spills over the diversion dam every year during the runoff season and also provide reservoir capacity for the storage of larger supplies of water during years of above-normal precipitation, for controlled release in very dry years through the existing diversion. By using this reserve water, the dry-year generation through the Big Creek system of powerhouses can be increased by over 400,000,000 kw-hr.

The Power Division of Bechtel Corporation was awarded a contract to make the detailed design of the project according to Edison general specifications and to start construction as soon as weather conditions permitted in the spring of 1953.

the middle of May. With the arrival of a pair of 2½-yd. shovels early in June, it was possible to start trench excavation for the outlet conduit through the dam. Haul roads were completed to the nearest borrow areas and the first embankment placed in the dam on June 15.

All dirt moving operations were placed on a 9-hr., 2-shift basis working 6 days a week. Mechanics were put on a 3-shift schedule in order to be available during all operations and to perform major servicing during the 4½-hr. shut-down between the end of the night shift at 1:00 a. m. and the start of the day shift at 5:30 a. m.

The compartively shallow cuts made in the borrow areas applied only to impervious material, in order to get out the required quantity for core and blanket. The underlying pervious sands and gravels were limited only by depth to ground water or strata of fine sand and silts.

Two Sierra Loaders were purchased as the best type of equipment for loading out the impervious material. Drawn by a tractor with all controls handled from the tractor by a single operator, a loader was found to be capable of excavating along a vertical face up to 5 ft. in depth and, by means of a 48-in. elevating belt conveyor, loading out a 20-yd. scraper unit in about 1 min. Particularly important was the fact that the vertical cut fed onto the belt afforded a considerable degree of blending of the material in the initial loading. The scrapers, in this instance, were used only as hauling units.

ELEVATING LOADER blends impervious material skimmed off wide-spread borrow areas in cuts up to 5 ft. high. Scraper units came into their own when moving pervious fill, tough to get out and unimproved by vertical blending.

Pushers helped load

In the pervious sections of the borrow areas, the DW20's were generally loaded as scrapers with the help of one or two pushers, depending on the type and compaction of the pit material. Production was comparable to the Sierra Loader but involved more and harder usage of equipment. Operations naturally varied during the season. At times, both shovels and the dump trucks were used for borrow pit embankment. In such cases, the shovels were spotted in pervious areas where embedded boulders in the gravel deposits interfered with the other types of loading. The trucks were also used occasionally as hauling units from the Sierra Loaders.

During the peak production month of September, slightly over 600,000 cu. yd. of compacted embankment was placed in the dam and blanket area. This was at a time when both shovels were available for borrow pit operations. Equipment used strictly for borrow pit excavation and haul during this period included a Manitowoc 3500 and a Northwest 80 shovel, 8 Kenworth dump trucks, 2 Sierra Loaders, an average of 15 DW20 scraper units and 4 International TD-24's used as pushers.

Embankment

Embankment placing followed conventional procedure. The 6-in. to 8-in. layers of material were disked and bladed to get the required amount of blending of moisture and material. As most of the embankment was placed by DW20's, a minimum amount of bulldozer spreading was required. Water, as far as practicable, was added at the borrow pits by 5,000-gal. water wagons or a semi-portable sprinkling system set up near available water. Additional water was added on the fill as required to secure maximum density.

Three 50-ton, rubber-tired articulated-wheel compactors were used

Concluded on page 122

BIG MOMENT FOR CLAY TILE

Washington building uses structural tile for moment loading—Prestressing does the trick on 50-ft. girders and roof slabs

A RESEARCH program begun more than three years ago, following a fire that razed the Clay City brick and tile plant of Builders Brick Co., south of Tacoma, Wash., has resulted in construction of a building that is believed to be the first of its kind in the world. The new building, to house a kiln, has a ground area measuring 50 x 60 ft., and a height of 25 ft.—enough to take it out of the "pilot plant" stage. Four girders, each 50 ft. long, and thirty 5 x 20-ft. panels were prefabricated from 6 x 12 x 12-in. load-bearing tile, all prestressed with high-tension steel rods and strands. Steel-reinforced columns were made from the same tile, which has an average strength of 10,000 psi. for the net cross section.

Steel stubbed into footing

Columns, on reinforced brick footings, are 18 in. square. They are reinforced with four 1¼-in. rods threaded into the tile in 6-ft. lengths, joined by welding and tied together at joints with ⅜-in. round ties. Reinforcing steel was stubbed into the footing and also extended above the columns for fitting into girders. The tiles were filled with grout as each column was erected, with a brick topping added on some of the columns to bring them all to uniform height. Erection of the columns, 20 ft. on centers in one direction and 50 ft. in the other, required an average of 2.7 man-hr.

Designed to support 70,000 lb.

The girders, each designed to support a 70,000-lb. load, are 12 in. wide and variously 38 and 43 in. deep. They consist of seven courses of tile, with four 1⅛-in. and two ⅞-in. prestressing rods. Each tile was grooved for a ⅜-in. vertical reinforcing bar extending about 4 in. above the girder for fitting into the roof panel. Grout was placed in the center void of each 3-cell tile to hold these rods.

Concrete section anchors tile

Each girder has a concrete section 30 in. long at each end which, plus a mechanical anchorage, serves to anchor the tile and also to provide a firm seat upon the column. In prestressing, pressures up to 99,400 lb. were applied with hydraulic jacks.

Girders for the work were fabricated at the construction site, but roof panels were formed in Tacoma at the plant of Concrete Engineering Co. Each panel was made up of four rows of tile 6 in. thick, with 4-in. spaces between rows. Three pretensioning wires of ⅛-in. diameter were placed in each space and stressed to 10,500 lb. Concrete was then placed between the tile rows, at each end of the slab to a width of 6 in., and at the midpoint of each panel. Lateral reinforcement was provided by a ⅜-in. bar at the midpoint and two ⅜-in. bars extending through the concrete pads.

Erectors put on show

Builders Brick invited a number of engineers and construction officials to view erection of the girders and slabs, which was carried out by a 4-man crew with a 20-ton crane in 4 hr. The heaviest loads were imposed by the deep girders, each weighing 8 tons.

With the roof slabs in place on the girders, grout was placed in the 4-in. spaces between panel ends, and also in the holes left in the girders and slabs for extending reinforcing steel from the lower members. Application of a roof covering completed the job.

Going into production

Since this building was an experiment, cost comparisons with other types of construction are not possible. Generally, the comparison to reinforced concrete is thought to be favorable. Builders Brick expect to provide girders and panels for other projects in the Seattle area during coming years. The company hopes to be fabricating the items for the building industry as a customary practice within two years.

Weight saving—40%

Greatest advantage in the use of the tile girders and columns is the saving in weight, estimated at 40%. Reason for the saving is the structural weight ratio of the structural clay used on this job, which is 10,000 psi. to 120 lb. per cu. ft. Furthermore, in the method of manufacturing structural clay units, voids are formed in the material close to the neutral axis, giving a further saving in dead weight.

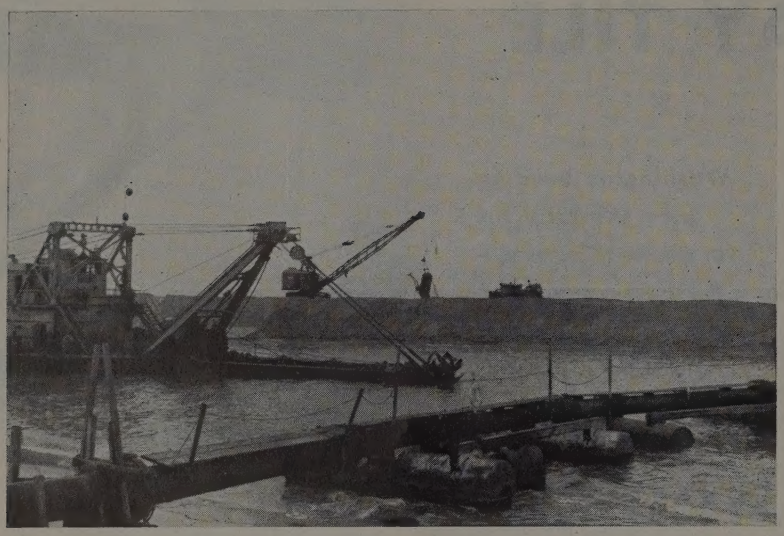
Fire kindles interest in prestressed clay tile

AN INDUSTRIAL FIRE was the single occurrence most nearly responsible for the unusual prestressed clay tile project reviewed in the accompanying article. In rebuilding its main plant three years ago, Builders Brick Co. named fire resistance as a principal aim. Tile would have been an ideal medium, but the fire had caught the company at a time when its stocks were relatively low, and making a new supply was impossible until the plant could be rebuilt. As a result, design and construction proceeded using precast concrete girders and roof panels.

But this project gave Builders Brick the impetus to launch a program of investigation. Under study was the feasibility of prefabricating the same building units from structural clay tile. Harry R. Powell, Seattle consulting engineer, directed the program, with preliminary experimental work done at the University of Washington Engineering Experiment Station by Jack Clanton, associate professor of civil engineering, and Dr. Jim Mueller, head of the department of ceramics, with the cooperation of professors F. B. Farquharson and A. L. Miller of the civil engineering department.

Dredging operation saves shoreline

Hydraulic dredging in the open sea has its problems — 4,000,000 cu. yd. are to be pumped to preserve former coastline



OPEN SEA in background could be problem to dredging operation except for constantly maintained levee.

HYDRAULIC DREDGING OPERATIONS in the open sea are now being carried out for the first time along the Southern California coast near Port Hueneme, the Navy's advance construction base. Because of breakwater construction at this point about 16 years ago, coastwise currents have added 600 ft. to the beach width immediately to the north, at the same time eroding coastal areas on the other side, especially near Point Mugu, site of the U. S. Navy Air Missile Test Center about 4 mi. south. The present beach erosion project, under Corps of Engineers administration, was awarded to Standard Dredging Corporation for $1,837,866 and will artificially reverse the situation, at least to the tune of 4,000,000 cu. yd.

Pumped 24,000 ft.

The first 500,000 cu. yd., urgently needed to protect existing Point Mugu installations, was pumped all the way from a dredged pond to the secondary feeder beach just northwesterly of the Point Mugu installations area. This is a distance of 24,000 ft. and includes a submarine line under the harbor entrance at Port Hueneme. All remaining yardage is being pumped only 6,900 ft., to a primary feeder beach just east of the harbor. From this point, littoral currents during coming months will carry the material to the Point Mugu vicinity.

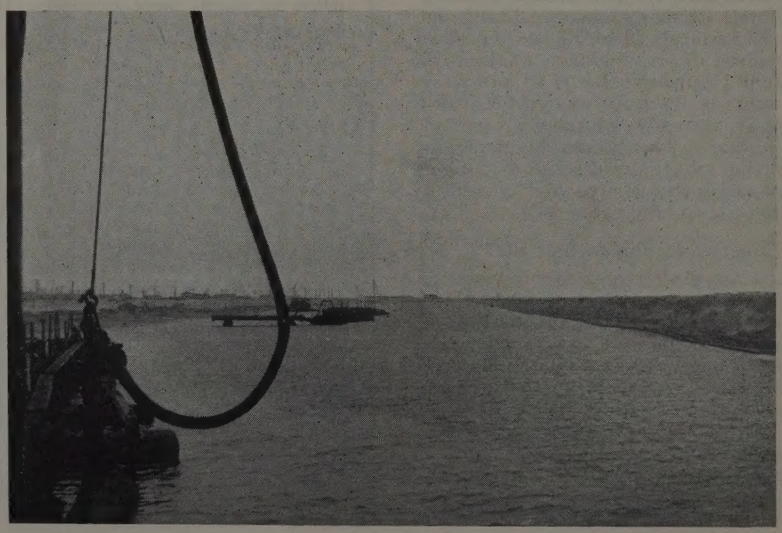
In the present operation, called Phase 2, a 27-in. dredge is cutting a series of "slots" westward from its protected pond into the open sea. The first of these was at the north end of the job. Later cuts, each overlapping the previous, are to the south, and each cut is dredged to el. —25 ft. Length of cut varies, but for the most part the work is not being carried beyond the natural 0.0 contour, a distance of about 450 ft. from the original protected pond developed in Phase 1.

The unit prices are $0.5995 per cu. yd. for Phase 1 pumping to the primary feeder beach, and $0.7895 per cu. yd. for Phase 1 pumping to the secondary beach. The rate is $225 per hour dredging time in Phase 2 with $127 per hour for lay time (stand-by time caused by inclement weather).

All in all, the biggest problem of the job is the job itself! Dredging in open sea like this is new and untried, and uncertainty rides with the job every hour. There was a touch-and-go time when the first sea cut was opened up. Breakers and a confused chop in the restricted opening were rough on the dredge and its pontoon line. The contractor looked forward to easier riding when he got his cuts down a little deeper, since the breakers would be partly replaced by swells.

Experience in the early weeks showed that the work could not be carried on continuously, or anything like it. Of course, this was February and early March, but it wasn't the season so much as the time of day. Generally it is found that during the first half of a period of flood tide, the job can be worked, but after that the swells became too much and the dredge must unhook from the pontoon line and "kite" for harbor. (And a dredge "kites" laboriously. This is the system of setting out anchors and winching up to them, time after time,

INITIAL dredging of Phase 1 opened 200 x 1,000-ft. protected pond 18 ft. deep.



to move the dredge.) Normal operation, therefore, has become one of going out to work during the last of the ebb tide, dredging through slack water and the first part of flood, and then knocking off again.

Review of production

Production is all-important on any contracting job, but a review of it here requires some explanation and qualification. First, dredges are described, or rated, by the size of the discharge line. At Port Hueneme, Standard Dredging is using its 27-in. hydraulic dredge *Los Angeles*. The *Los Angeles* takes in through a 30-in. suction and discharges through the 27-in. line. When this pipe was strung out for 24,000 ft., earlier in the job, a booster pump was installed at the 13,000-ft. mark. Pumping pressures then ran up to 135 psi. Now, with only 6,900 ft. of pipe out, more or less, the pressure is in the range of 120 psi. The yardage figures are even less stable. Back in January, pumping 24,000 ft., the contractor moved approximately 375 cu. yd. per hour. The figure is higher now on the shorter 6,900-ft. pumping distance—when the rig can work at all—and it runs an estimated 900 yd. or more per hour under good conditions.

Dredging operations are confined to a 4,200-ft. strip of beach west of the Navy base at Port Hueneme. Here a pond 200 ft. wide was cut, leaving part of the natural beach to the west as a levee.

The levee or dike is extremely important to the work, as its maintenance permits the operation of the dredge when, because of weather, it would otherwise be impossible. The dike is maintained constantly by a 2½-yd. Northwest 80D dragline and a Caterpillar D8 bulldozer working together, their main effort being to push the nose of the levee northward near the ever-widening cut to seaward. Action of the sea at this point is trying to cut and wash away the levee.

Cats restored beach

All the answers weren't known when the operation first got under way. And for a while the beach was washing out as fast as the dredge advanced. This condition was remedied by two Caterpillar DW21 tractor-scrapers, six 15-yd. Caterpillar carryalls with D8 tractors, three D8 bulldozers, and two International TD24 bulldozers working 24 hours every day for one week. This restored the 1,000 ft. of beach. Then a smaller amount of land equipment maintained the beach and extended the levee as the dredge progressed. And a good thing, because success could depend on this single point.

Proper emphasis on the unique features of this dredging job, and of the dredge operation itself, requires comparison with more conventional

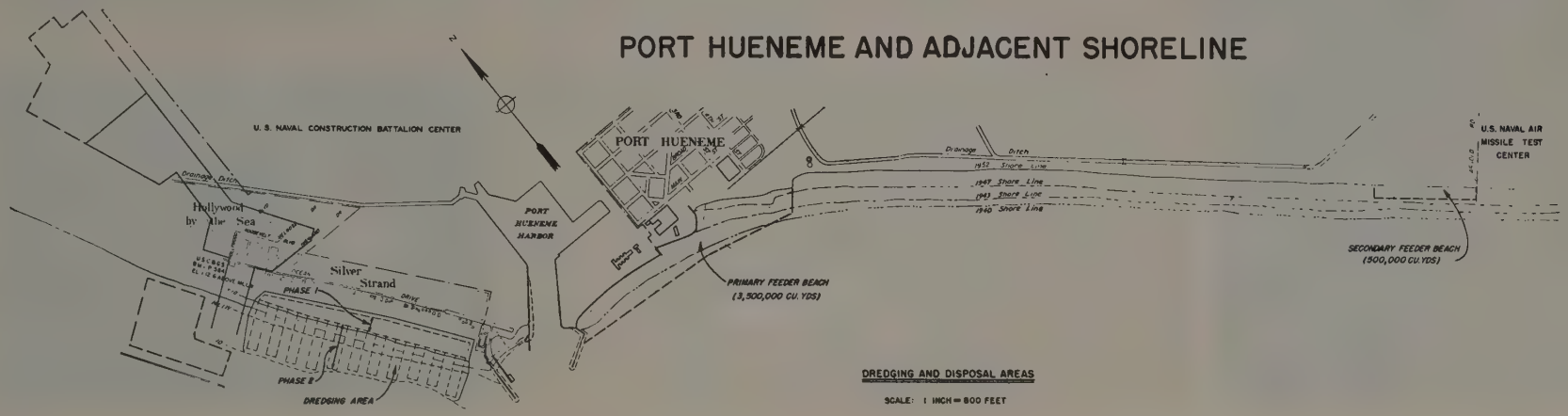
PORT HUENEME HARBOR was constructed by local interests in 1939 and purchased by the United States Navy Department in 1942. Because of littoral drift from the northwest at the harbor entrance, down-coast erosion necessitated the construction, in 1942-43, of about one-half mile of stone sea wall to protect shore-line property. However, without a sustaining littoral supply, the beaches down coast from that structure continued to erode. The shore line has receded more than 700 ft. near the down coast end of the sea wall, and considerable erosion is evident at Point Mugu 10 mi. down coast.

A survey report was submitted in May 1950. In this report, it was determined that erosion could best be checked by the periodic by-passing of sand from the coast beaches to restore littoral drift and that approximately 500,000 cu. yd. of sand should be transported to the down coast beaches annually in order to maintain the local sand budget. It was also found that substantial contribution could be made toward restoration of the eroded land and beaches by dredging about 3,000,000 cu. yd. of material from a small-craft harbor a short distance up coast from the Navy harbor and by depositing dredged material along the down coast shore.

The plan of improvement provides for a separate jettied harbor entrance about one mile up coast from the entrance to the Navy harbor and a sand trap from which accumulations of littoral drift would be dredged periodically. The trap would comprise an off-shore breakwater 2,300 feet long providing partial protection for the harbor entrance and a protected lee in which littoral drift would settle and accumulate between dredging operations estimated to be required at about 2-year intervals.

Estimated total federal first cost of the harbor and initial dredging of the sand trap is $5,000,000, (1952 prices) and the annual charges at $487,000. The portion of the first cost to be borne by local interests was estimated at $1,728,000, and they have indicated their willingness to assume this obligation.

The Navy's requested report from the Corps of Engineers was accepted and the latter prepared plans and specifications, advertised for bids, made the contract award, and administered the contract to effect the protection desired with funds provided by the Navy.



New caulking material for sewers

Water causes yarn to expand, providing watertight joints—Means tighter specifications for leakage and possible infiltration

By
RICHARD M. STARNS, JR.
Consulting Engineer,
Berkeley, Calif.

YARN SERVES as a sling (top) for pipe and helps centering by being in bell when stabbing spigot end. Caulking (bottom) is as easy as when older methods are used.

A LITTLE OVER a year ago the San Pablo Sanitary District, Contra Costa County, California, found itself the not-too-proud owner of a sewer system that had finally reached the limit of its capacity. Increasingly inadequate since the boom years of the war, swollen with wet season infiltration, the system had almost literally come apart at the seams. Sewage was backing into houses and manholes, running in gutters, and menacing public health in the most serious way.

Now has 42,000 ft.

Today, just 10 months after beginning construction on a $1,100,000 sewer project, the district owns some 42,000 ft. of new and exceptionally watertight interceptor sewer lines. About 9,000 ft. more of lines, plus a $328,000 primary treatment plant, will be completed in July, and the district will have taken the first and biggest step toward a sewer system ultimately capable of serving almost double its current population.

Much of the credit for the success of the job belongs to a newly developed, self-sealing jointing material for bell-and-spigot pipes, Sealite caulking yarn. In fact, this yarn and its assurance of economical yet watertight joints was of basic importance to the design and construction of the entire project.

It speeded construction by being easy to install and by enabling the contractors to make up tight joints regardless of whether the pipe was dry or soaked by winter rains. Nearly two-thirds of the new lines were laid during the recent rainy season, between October and April.

Maximum leakage allowance

It contributed to design economies by making possible a maximum leakage allowance of 400 gal. per mi. per day, per inch diameter of pipe, as tested under a 4-ft. internal hydrostatic head. Its ability to control infiltration had a direct bearing on line sizes and treatment plant capacity.

For example, without the yarn it would have been necessary to allow for 3,000 to 4,000 gal. of infiltration per mi., per day, per inch diameter of all large-size trunk lines, particularly those laid in tidal flats. Such an infiltration allowance would have required a corresponding increase in pipe sizes and plant capacity.

The story of the San Pablo project is, in part, the story of how a modern jointing material contributed to the solution of a difficult problem in design and construction. Beyond this, it is a story which has considerable historical relevance for other communities, particularly in California, since many of them face similar public pressures.

In California, the most significant of these pressures is embodied in the state anti-pollution law. Passed in 1949, the law forbids the discharge of untreated sewage into rivers, creeks or other state waters, sets up regional water pollution boards for its enforcement, and marks off an era in which pressure has been applied to every community in the state to treat its sewage. Under the law, San Pablo, like every other community and sanitary district on San Francisco Bay, was notified by the regional water pollution board to stop discharging untreated sewage into the bay.

Immediate causes

The immediate causes for the San Pablo project, however, were even more impelling. Even as the anti-pollution law was passed, it was beginning to be apparent that the district's collection system was no longer adequate. By the winter of 1952-53, conditions were so bad that toilet facilities in private homes were rendered useless, in some cases, for as long as three months.

Two underlying factors led to this crisis. One was the increase in population during and after the war, an increase that far outstripped the capacity of the existing lines. From 1940 to 1954 the population of the district jumped from approximately 6,000 to an estimated 31,500.

The other factor was infiltration. Comparatively speaking, the rate of infiltration in the district was not excessive. On the other hand, most sewer systems in the area have a considerable amount of infiltration because, until recently, watertight sewer lines have not been economically feasible. The San Pablo sewer system, like many others, was able to handle dry weather flows, but had increasing difficulty handling the exaggerated flows of the rainy season.

Writer retained

In January 1953, the district, under pressure from taxpayers and state, county, and local authorities, retained the writer to conduct a thorough study. The seriousness of the situation, plus the remembered defeat of two previous improvement proposals, gave a particular urgency to the need for increasing the system's capacity at the lowest possible cost. It was important that any new proposal be made as financially attractive as possible.

At the same time, the district recognized that any planned additions must provide for the future, both as to quality and capacity. This meant that infiltration had to be controlled. Otherwise the district might have to build more lines every few years, or be faced with the necessity of making premature additions to a two- or three-year-old treatment plant.

The district requirements determined by the writer and ultimately accepted by the San Pablo Sanitary

District called for 50,925 ft. of new vitrified - clay, bell - and - spigot pipe lines, ranging in size from 6 to 33 in. These lines were to be laid parallel to the existing interceptor lines in most cases, at a contract cost of $530,000. The treatment plant was designed to treat an average flow of 7 mgd. and a peak flow of 10.6 mgd., the estimated 1969 load. The design provides for additions which will enable the plant eventually to handle a peak flow of 13.1 mgd. when the district reaches its anticipated ultimate population of 60,700 plus 25,300 industrial equivalent.

Specifications

Following exhaustive tests of Sealite caulking yarn and other jointing materials, specifications were written calling for the use of hot-poured bituminous compound in combination with a joint gasket material having the sealing properties of Sealite caulking yarn. Although the yarn had been developed only since early 1952, the writer knew of its use on projects for the State of California and the Army Engineers. On the state project at the Los Guilucos School for Girls, 10,000 ft. of vitrified clay lines jointed with the yarn and hot compound met a leakage allowance of 300 gallons per mile, per day, per inch diameter, when tested under a 4-ft. internal hydrostatic head. The Army Engineers had used the yarn under adverse ground water conditions at Mather Field, Sacramento, Calif., with good results. In the laboratory tests conducted prior to writing specifications, the yarn had held leakage to between zero and 158.4 gallons per mile, per day, per inch diameter, under 8-ft. internal hydrostatic heads.

Speed and economy

If the yarn could meet a 400-gal. per mile, per day, per inch diameter leakage allowance at San Pablo, there would be no question of the adequacy of the design, and the district would be assured of economical and efficient sewer service.

Parallel to the need for economy was the need for speed. It was imperative to provide relief for the district as quickly as possible. The preliminary study was completed during January and February 1953, a bond election was held on May 3, and plans and specifications were drawn up immediately after financing was assured by the passage of the bond issue.

Construction on the first portion of the project was begun on June 14, 1953, by Kevry Construction Co. The firm of Prodanovich, Krzich, and Rodrigues began its portion of the job on October 15, and Associated Engineers started the final section of pipe on March 29, 1954. The treatment plant is being built by Marvin Collins, Ltd.

Took 132 working days

Kevry laid 18,864 ft. of 10- to 24-in. diameter lines in 132 working days, finishing on January 19, 1954. Prodanovich, Krzich and Rodrigues are to finish laying their 23,883 ft. of 6- to 33-in. pipe by May 15, while Associated Engineers and Marvin Collins, Ltd., plan to complete their jobs in July. Associated Engineers is responsible for the final 8,178 ft. of 10-, 12- and 15-in. pipe.

Aside from rainy weather, conditions which hindered construction were excessive groundwater, quick-

What it's made of

The self-sealing jointing product whose use is described by Mr. Starns is a rope-like material with a jute core. The jute is impregnated with a chemically inert, powdered sealing compound and treated with a high potency root-inhibitor. It is encased in a woven cotton jacket.

During an initial 3 to 6-hr. contact with water, the sealing compound expands, packs the yarn tightly into the bell socket of a bell-and-spigot joint, and transforms the yarn into a gelatinous, water-resistant barrier. The compound also forces its way through the yarn and into any voids or cracks in the backup joint compound or mortar used to fill the bell. The yarn tends to self-repair, by additional expansion, potential leakage areas created by pipe movement. The yarn remains in its highly plastic, expanded state, so long as contact with water is maintained. If the yarn dries out in the joint after initial construction, it re-expands rapidly upon renewed contact with water. The expansion process does not exert sufficient pressure to break or damage vitrified clay or concrete pipe.

The active agent of the yarn, the powdered compound, is not affected by alkalies or acids ordinarily met with in sewer lines. The compound protects the jute fiber from chemicals by forming a coating around it.

The yarn installs easily, makes flexible joints, and tends to align joints automatically. It is manufactured in sizes to fit the annular openings of all sizes of bell-and-spigot pipes.

Besides the jute-core yarn, two other types are manufactured for specialized uses. One is an asbestos-core yarn with a fiberglass jacket, for industrial sewers or water mains. The other is a cotton-core, cotton-jacket yarn for water mains. Both have the same sealing properties as the jute-core yarn, and can be furnished with a self-sterilizing agent. Information on these yarns can be obtained from Sealite, Inc., 8923 San Leandro Street, Oakland, Calif.

RESTRICTED AREA of 14-ft.-deep trench makes sling aspect handy (top); centering pipe and cutting yarn to exact length follows (center). Caulking is no problem in 17-ft.-deep wet trench (bottom).

sand, and the necessity for deep trenches.

Some 16,000 ft. of 15- to 33-in. pipe was laid in low ground near the bay, in an area underlaid with tidal mud. The ground water in some places was eight feet over the pipe, and continuous pumping was necessary to make the trenches workable. To provide a stable bedding for the pipe, it was necessary to fill the slushy trench bottoms with from one to four feet of base rock.

Had to be deeper

The depth of the trenches exaggerated the ground water problem. It was necessary to lay the new sewer lines deeper than the existing sewer, water, and gas lines to avoid conflicts, and the result was trenches from 8 to 22 ft. deep. Where the cover over the top of the pipe was 12 or more feet, the pipe was encased with concrete to a height of approximately two-thirds its vertical diameter to forestall the possibility of its being crushed or displaced by backfill.

A special construction problem was presented by a bed of flowing quicksand, encountered while digging a trench for 33-in. pipe. The contractors, in this case Prodanovich, Krzich and Rodrigues, drove interlocking steel sheet-piling down the sides of the trench, through the quicksand and into the underlying clay. With the trench sealed off in this way, it was possible to excavate the quicksand remaining in the trench. From 2 to 4 ft. of base rock was then poured into the trench. About 500 ft. of trench was excavated in this way. The sheet-piling was left in for a 20-ft. stretch of the worst section to prevent the gravel bedding from dissipating into the adjacent quicksand. The rest of the sheet-piling was removed after the pipe had been bedded and backfilled.

Another unusual operation was the use of a Hydrauger to bore under a railroad embankment. The auger, placed inside a 30-in. steel casing, bored a hole slightly larger than the casing. The casing was forced through the augered hole, by means of jacks pushing on its rear end, and followed the auger closely to prevent the embankment from caving in. Cast iron pipe was laid inside the jacked-casing. Except for two creek-crossings where the pipe had to be suspended from bridges, this was the only section requiring other than vitrified clay pipe.

Speeded construction

The use of Sealite caulking yarn in place of oakum helped speed construction in two ways. Since the joints were to be sealed by the yarn and not by the hot-poured compound, the quality of the bond between the pipe and the compound was of no great importance; hence, it was possible to proceed with construction immediately following rainstorms, even though an inferior bond might result between the wet pipe and the compound. The primary functions of the compound were to provide a backing for the yarn to expand against and to hold it mechanically in place.

Also, it was easier to make up joints with this new yarn than with oakum. Unlike oakum, the yarn is in the form of a rope, and requires only one loop, plus two inches overlap, for each joint. When a section of pipe was ready to go in, appropriate lengths of yarn were cut in advance. The pipe-layer looped the yarn around the spigot, held the ends, and used the yarn as a sling to support the spigot while it was driven home. He then caulked the slightly moist and plastic yarn tightly into the bell socket with a blunt caulking iron.

Inspection maintained

Close inspection was maintained to see that the yarn was caulked snugly all the way around into the bell socket. This prevented hot compound from pouring through into the pipe interior, and guaranteed that the yarn would perform at maximum effectiveness. It also assured proper alignment of the pipe at the joint, preventing irregularities which could cause stoppages.

Special care was taken with warped or out-of-square bells. To install the yarn in the tight side of a warped bell, it was flattened with the flat side of a caulking iron. To fill the wide side of a warped bell, an additional short length of yarn was used besides the original strand. Pipe which did not meet A.S.T.M. tolerances was rejected.

With the success of the job depending on the tightness of the lines, testing took on critical importance. Relatively few contractors have had their work subjected to stringent tests, largely because there was little sense in expecting them to do the impossible with the materials at hand. In this case, however, the ability of the caulking yarn to control leakage and infiltration had been proved beforehand, and the design was based on the assumption that the lines would be tight. Accordingly, strict tests were specified.

Testing procedures

Testing began after the lines were completed and the trenches backfilled. A section between manholes was plugged off except for the downstream opening in the upper manhole. Where grades were slight, two or more sections were tested at once.

The test section and its adjacent manhole were filled with water to an elevation of four feet above the top of the pipe at the midpoint of the section, or four feet above the existing ground water elevation, whichever was greater. Water was introduced into the test section at least four hours in advance of the official test period to allow the pipe and jointing material to become saturated with water. Since the yarn works by absorbing water and expanding into a watertight gel, accurate testing depended on its being allowed enough time to undergo sufficient expansion.

At the beginning of the test period the elevation of water in the upper manhole was carefully measured from a point on the manhole rim. After two hours, the water elevation was again measured from the same point on the manhole rim to determine the loss of water during the test period.

Whenever an initial test showed excess leakage, the water was drawn off and the manhole tested. This was accomplished by plugging all the openings in the manhole and filling it with water to the same elevation as for the line test. The leakage from the manhole was deducted from the total leakage of the test section in arriving at the final figure. After testing, the manholes were waterproofed, where necessary, by grouting with cement mortar.

Watertightness obtained

The results of the tests on the 18,864 ft. of pipe laid by Kevry Construction Co. indicate the watertightness being obtained on the finished lines. Under the prescribed 4-ft. hydrostatic test head, the maximum

Concluded on page 122

Equipment

KEVRY CONSTRUCTION CO.

- Buckeye 160 trenching machine
- Buckeye 407 trenching machine
- Cleveland Model 95 wheel-type trencher
- Link-Belt Speeder Model 51 Crane
- Allis-Chalmers HD-5G loader
- International T-9 tractor, equipped with a Trackson swing crane
- Austin-Western 88-H grader
- Littleford 600-gal. oil distributor
- Littleford street broom
- Tampo tandem roller, 5-8 ton
- Jaeger 75-cu. ft. compressor
- Jaeger 125-cu. ft. compressor
- 2 Ford F-6 5-yd. dump trucks
- 3 Chevrolet ½-ton pickups

PRODANOVICH, KRZICH, AND RODRIGUES

- Allis-Chalmers HD-14 bulldozer
- International T-9 swing boom
- 2 Allis-Chalmers HD-5 front-end loaders
- Hough front-end loader, with wheels
- Galion 101 grader
- Shield Bantam ½-yd. truck crane
- Bucyrus-Erie back hoe
- Bay City ¾-yd. crane
- Buckeye 120 trenching machine, ladder type
- LeRoi 210 compressor
- LeRoi 105 compressor
- Ritchey-Miller tamping machine (for 95% compaction)
- Ingersoll-Rand air pump
- 3 Construction Machinery Co. water pumps

CONSTRUCTION CAMP HOUSEKEEPING (Western-style)

Big Western-type jobs, running on fast schedules at isolated sites, require quality of accommodations and services better than that of a small city — Paul Bunyan would be proud of the housekeeping setup on the Alcan Project (noon chow line-up above), not to mention other recent big ones. Here's the story, straight from a specialist

AS TOLD TO

H. E. ECHOLS

Administrative Manager

Morrison-Knudsen Co. of Canada, Ltd.

Kemano, B. C.

by

MILO M. MARCHETTI

Director of Camps

PAUL BUNYAN and his office manager, Johnny Inkslinger, were the first ones to organize construction camp housekeeping on the scale that we know today. To grease the griddles for hotcakes, Paul Bunyan had flunkies skate about on the griddle with bacon rind strapped to their feet. Supplanting Paul Bunyan and other brawny men of song and legend, a new clan of men and women of this century has ably carried on with an assist from modern methods and equipment. American dollars have penetrated nearly every corner of the earth. And they have been followed by American (predominantly Western) construction methods, construction machinery, and construction men. These men—and their families—require housing, feeding, recreation, churches, schools—in short, everything they have at home.

The evolution of the construction camp has been going on for a long time. Once upon a time a local contractor got ambitious. He left the home town to take a contract for clearing and grading a stretch of railroad somewhere toward the West. He improved the old slip scrapers—even putting wheels on them—and he used mules to pull them. He had to take on some outsiders who had lots of the language that gets work out of mules. He found he could make more money by letting out the rock work or heavy cuts to immigrants on a piece work basis.

Camp facilities were the simplest. Tents or railroad work cars served

MILO MARCHETTI, Alcan Project Camp Director, with two members of his "Dormettes" softball team. Women's ball league at the camp provides Milo with one of his more pleasant duties

MILO FEEDS 'EM— BY THE THOUSANDS

MILO WORKED UP through various jobs and departments and became a partner with his father in the catering business. In the Los Angeles area he has been catering director of the Roosevelt Hotel, the Hollywood and Beverly Hills Rotisseries, and the manager of numerous Marchetti cafes. As head of Marchetti Caterers, Inc., he held the job of housing and feeding up to 35,000 army and civilian personnel in 19 camps and 20 snack bars immediately after the Pearl Harbor bombing at Honolulu. He has been camp superintendent for various contractors on large projects in Utah, California, Guam, French Morocco, and British Columbia, and has been responsible for the care of 5,000 to 12,000 persons per camp.

When tracked down for an interview one evening, Milo had just returned from an inspection trip to outlying camps in a jeep over a rough and steep mountain road. This seemed a good time to find out how homesick he was for the Hollywood type of catering, but that was the wrong thought to make him feel sorry for himself. Milo said, "While the feeding of Hollywood movie stars in Los Angeles and catering to the plush restaurant and night club trade is a far cry from feeding a bunch of miners and construction stiffs at Kemano, I have found that all groups appreciate good food, good service, and pleasant eating surroundings. I always try to make the surroundings in camps I operate as pleasant as possible. When great quantities of food have to be processed, handled, cooked, and served, it takes a well run organization to keep the wheels moving smoothly." From that point on we pooled our experience to get this information.—*H. E. Echols.*

for housing. Feeding was often arranged by the men themselves. And on the Saturday paydays everyone headed for the nearest town to whoop it up and, incidentally, to build an unsavory reputation for construction camps. On Sunday nights the farsighted boss usually dragged back with him a new cook and a new supply of lemon extract. The theory, well proved in practice, was that the old cook either would not be back or would be laid out, having consumed all the extract with alcoholic content!

Individual efforts important

Today, as we go farther into the back country to develop our resources, the scope and cost of work to be performed under one general contract has increased. These contracts require skilled personnel in numbers not to be found locally. Labor costs, and the additional cost of recruiting, are high; so the fullest utilization of every individual's efforts has become a matter of prime importance. Thus have developed today's refinements in construction camps.

Milo M. Marchetti is Director of Camps for Morrison-Knudsen Co. of Canada, Ltd., contractors on the vast Alcan Project in British Columbia. On this project, in the Kemano-Kildala area alone, the contractor has set up and operated 20 different camps, in addition to small flycamps at locations accessible only by helicopter. Fifteen of these camps now are in operation.

Marchetti's department comes under the administrative, or business, manager in a construction organization. The duties of the Director of Camps include requisitioning of the initial camp buildings, equipment and supplies, and keeping ahead of subsequent changes and requirements. Milo's biggest headache is caused when, after being consulted as an expert and making out requisitions for what will be needed, he reaches the job and finds that up to 50% of his requisitions have been cut by someone! A big job running on a fast schedule is slow to recover from this kind of surgery.

The project manager or construction superintendent is trained from the construction standpoint of getting a job done speedily to specifications and within a price. It is not surprising that it is difficult to convince him of the need for the quantities of material and the number of personnel requisitioned for services. These items are not listed in the contract at so many dollars upon completion "in a workmanlike manner." However, his force report would show him that one of each ten persons on the job is working in the camp or services of supply.

Long list of problems

For one project the top people were able within a day or two to requisition and start moving towards its overseas destination $25,000,000 of heavy construction equipment. At the same time an initial requisition for $1,000,000 placed by the camp manager was, for weeks, the happy hunting ground for questioning persons with big blue pencils. The top management is usually too busy at this stage to personally review all requisitions. It takes a line of men without blankets, cigarettes, or the makings of hotcakes to get prompt telegraphic and airlift action.

The many, many items which must be considered in modern construction camp housekeeping include the following: (1) feeding the construction personnel and sometimes their dependents, (2) assigning housing, (3) general housekeeping, (4) sanitation, (5) laundry operation, (6) maintenance of water supply, sewer systems, roads and streets, (7) providing of security and policing, (8) recreational activities, (9) operation of commissaries and grocery stores, and (10) providing postal, banking, religious, and educational facilities.

Just like a city

In general, these activities are comparable to those required in a town or city of equal population, modified by the location of the project and the comparatively short duration of the operation involved. The average quality of the accommodations and services is much higher than that of an established community. The planning is done primarily for contractors' employees, but the families and dependents of the employee must also be considered. It is much harder for them to adjust themselves on isolated projects. Recreational facilities required are in direct proportion to the distance from populated centers or accustomed haunts.

The costs of running a construction camp are reasonable under competent supervision and planning. On the Alcan Project, where most costs are relatively high, they run about 60¢ per meal for food costs or $1 per meal including labor and supplies. About 8,000,000 meals have been served at this project, so it can be seen that subsistence is an important item of construction costs. Housing costs will also run 60¢ per man per day. Many factors, some embodied in the contract, influence profit and loss accounting for mess hall operations, but it is estimated that 50% of these costs will be chargeable to project costs. Where the location or size of the project justifies the operation of bakeries, milk restituting plants, or services for which full book value charges

can be made, a substantial book profit is shown to offset losses in other operations.

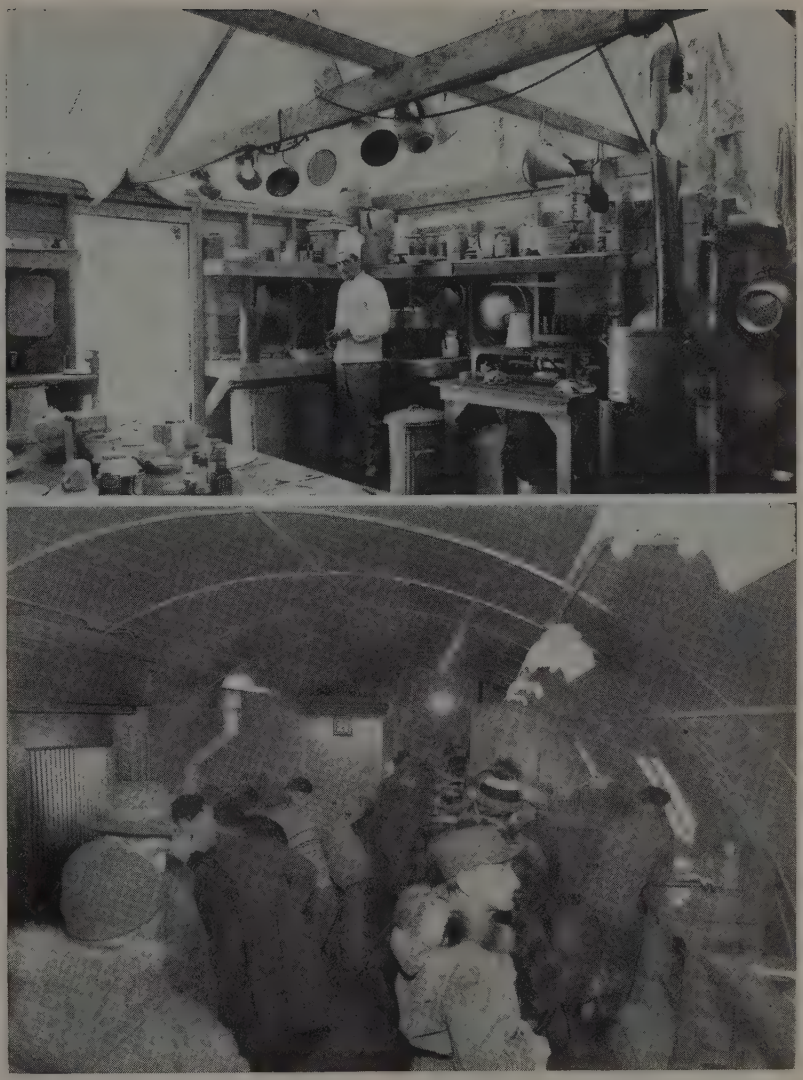
Locality, type of mess hall construction provided, and the size and scheduled duration of the job will all influence mess hall arrangements. One efficient plan is the use of two 50-ft. wide Quonset mess halls connected by the kitchen and stock room section. This permits the spacing of two rows of tables seating 12 persons each, divided by a wide center aisle, and provides a total seating capacity of 1,000. Whatever seating arrangements are provided, they are uniform for all personnel. The setting aside of "blue rooms" for privileged personnel is frowned upon by construction management. Sections may be reserved for superintendents, engineers, office workers, women employees, subcontractors, guests, and even for some separated crafts. This has advantages in providing contact to discuss job-wide information. But the quality and quantity of food and service is uniform, and it must be consistently good.

Expert consideration is given to the matter of feeding and housing, and the best practical methods are used. Cafeteria style serving has been tried with not much success or downright failure. An 800-man mess hall with the tables set, including the hot dishes at the last minute, will receive, serve, and empty the mess hall of 800 men in less than one-half hour and have the work started for the next setup. It has been impossible to do this with cafeteria style serving. The office workers like the cafeteria system, but they also like to loiter a half hour or so after the eating. This does not work in with the construction stiff's personal schedule.

The camp menus are made to satisfy the most discriminating taste as to quality while the quantity displayed would satisfy the most Gargantuan appetite. It may fail of perfection in small one-cook camps, but is consistent in larger spreads. It has to be good. A superintendent or project manager pushing a construction job cannot afford to be annoyed by inefficiencies in the camp department, the accompanying loss of morale, the "beefing" of workers, and the resulting loss of production on the job. A sample menu is presented elsewhere on these pages.

After quality and quantity of food, well served, comes precision of scheduling of meals. No excuses are accepted for meal service being delayed. With three shifts working on construction, the meals sittings at Kemano are promptly at 6:15, 7:15, 8:30, and 11:25 a. m.; 3:10, 5:00, 6:00, 8:00, and 11:00 p. m., and again at 12:45 a. m. The additional sittings at noon and evening are required because of limited seating capacity. On this project skilled attention is required to prepare and deliver on time 1,000 lunches daily to men working miles back in the tunnels and other remote places.

The food and services are planned for a certain number of people at each sitting with 9 cooks and 35 waiters on



TWENTY DIFFERENT CAMPS on the Alcan Project mean twenty kitchens of sizes and capacities to fit camp requirements. Kitchen above is in a tent at a small "line" camp. Despite the isolation of the project, money remains as the medium of exchange. Project branch bank (bottom) does a booming business on payday.

"PIGS IS PIGS"— IN CONSTRUCTION TOO

GARBAGE DISPOSAL at large camps presents a problem. Sometimes it is burned, sometimes disposed of in incinerators, and occasionally the bulk of it goes to local hog farms. On one big job in Alabama, being constructed by the federal government, official approval was obtained to purchase feeder pigs and hogs, fatten them, adding local corn, not liquid, which was plentiful, and "selling" the pork to the camps where ample refrigeration was available. A very fine and profitable installation was operated after a specialist in hog raising was employed. Strict accounting was made on the basis of number of head and weight of pigs purchased and the number of head and weight of hogs slaughtered and delivered to cold storage. All went well until, in the natural course of events, litters of pigs began to arrive. Subsequent reports to Washington showed more stock on hand than the difference between reported authorized purchases and sales. We could never satisfy Washington with our explanation about flowers, birds and bees—and hogs. It looked like another "pigs is pigs" classic was in the making. At last report, after reams of correspondence, they were still trying to correlate official approvals with unapproved events.

A FAR CRY from the tents and railroad cars that served as housing on projects in the twenties, prefab houses and trailers make comfortable temporary homes for Alcaners.

duty. The precision of this planning can be upset if a number of men, working on the day shift, decide to drop in at 8:00 or 11:00 p. m. for a "mug up." The sittings were recently overtaxed by 100% additional men. Meal tickets of colored cards, to be changed every two weeks, were printed on the job and issued to personnel authorized to eat at these meals. One recent arrival, new to night shifts and construction vernacular, was disconcerted to receive a dark purple card with big letters,

GRAVEYARD BREAKFAST
11:00 p. m.

Milo is proud of his organization, and he insists that the work operates efficiently. The direction of the outlying camps is assigned to a traveling chef who constantly makes the rounds. He has been fortunate in having the services of renowned chefs who have served in the finest hotels and on ocean liners. These experts are temperamental, and the turnover of all personnel in this department is high. It is especially high in all departments where only a short period of employment is required to receive return transportation upon termination.

30 tons of meat

Refrigeration of perishables is necessary in transit and at the job. The Alcan Project has over 100 refrigeration units in operation, varying in size from 600 to 3,000 cu. ft. each. Thirty tons or more of meat are kept in zero storage at Camp No. 5 for use and distribution to other camps. At the more inaccessible camps, refrigerators are flown in by helicopter. Approximately 20 tons of meat, 2 tons of butter, 10 tons of potatoes, and 5 tons of fresh vegetables pass through the camps each week.

Meat is inspected, selected, and stamped by specialists at the point of procurement. Should a question arise on the job as to the condition of perishable foods, it is at once called to the attention of the doctor. Some spoilage of fresh vegetables or foods occurs during shipment, but very little at the job because it is scheduled to be used immediately. Constant inspections are made to maintain sanitation and cleanliness throughout the camp operation.

A dairy or restituting plant is operated on the Alcan job. Milk powder and sweet butter are processed to make milk and cream having the same percentages of butter fat and serum solids found in fresh milk. The product is pasteurized and homogenized at 2,500 psi. pressure. It is used in the mess halls and sold at the job-operated commissary and grocery stores. Over 16,500 gal. of milk plus 4,500 gal. of cream and ice cream are consumed on the job weekly. The product meets Dominion and Provincial Government requirements. Samples are sent by plane twice monthly to a laboratory in Vancouver for testing.

A modern bakery is also operated here. It produces weekly 10,000 loaves

HOT CAKES IN ICELAND — TOO MUCH TO ASK?

ACCORDING TO ECHOLS, the American construction stiff expects and gets hot cakes, eggs, bacon, and fruit for breakfast whether in the Aleutians, Iceland, Brazil, or the Sahara Desert. He may learn to handle the Continental cognac, but the Continental breakfast leaves him cold.

On the Alcan Project, the author observes, "A table is set up at each meal with coffee, tea, butter, milk, cream, fruit juices in pitchers, honey, jam and marmalade, and a great variety of condiments. Pies are served every day and ice cream twice weekly. You can see why it takes a man with a strong won't-power to push back from the breakfast table in time. Here are examples observed at the Kemano mess hall."

BREAKFAST	LUNCH	DINNER
Fresh oranges, apples or peaches	Five kinds of bread and rolls	Three kinds of bread
Canned pineapple	Tossed vegetable salad	Boiled egg and lettuce salad with mayonnaise
Toast (white or wheat)	Celery, pickles and beets	French fried potatoes
French toast	Mashed potatoes, carrots and peas	T-bone steaks with mushrooms
Fried eggs, bacon or ham	Cold cuts, liver and onions	Roast turkey with dressing
Hot cakes and maple syrup	Corned beef and cabbage	Cold cuts
Choice of cold cereals	Baked spareribs	Raspberries, ice cream (5 flavors), choice of cake or pastry
One hot cereal	Crackers and 2 or 3 kinds of cheese	Oranges and apples
	Assorted pies, orange jello, whipped cream	

Echols adds, "This list is as observed and not the way it would be set up on a fancy restaurant menu. I may have missed something because I was so busy at my own end of the table that I didn't get a good look at the other end!"

of bread of seven varieties, 3,500 fruit pies, 5,000 Boston cream pies, 2,000 lb. of fruit and pound cake, 1,200 dozen doughnuts and Danish pastries, and approximately 1,500 dozen rolls, macaroons, cookies and cream puffs.

The management of the project commissaries is very important. This operation is big business, much more so than the contractors themselves realize. Commissaries have grown as a necessary evil, operated as an accommodation, and grudgingly acknowledged in planning. Markup is 10% to 15% to cover reasonable losses in operation and misjudged inventories. The contractor can and has taken severe losses that make him reluctant to go into the operation at all. His business is construction, but he must keep his personnel working and reasonably content.

Complete line of everything

The demands upon the commissary by employees and their families on a large project at a remote location are tremendous, especially in foreign lands. This demand includes a complete line of groceries, meats, and fresh vegetables; American food—no substitutes accepted for long—; men and women's work and dress clothing; American cigarettes, tobaccos, and snuff; candies, ice cream, and ice cream cones; all popular soft drinks, American magazines and newspapers, radios, record players, toilet goods, drug sundries, cards for all occasions, hardware and furnishings dependent upon what is furnished by the contractors, and souvenirs. Purchases at the commissaries and stores on a job of this size will run $200,000 monthly.

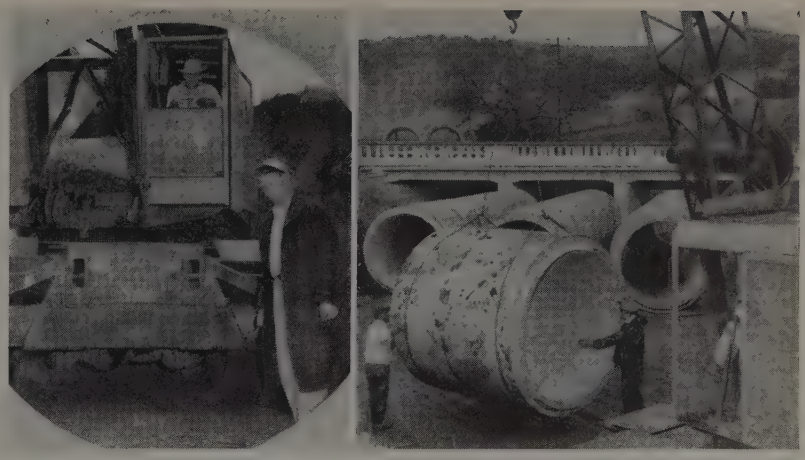
I was putting away my notebook, complimenting Milo upon the fine spread he was operating here, remarking how good it must feel to be all set for a few years on one of these large jobs, when he looked around, lowered his voice to a confidential pitch and said, "Would you do me a favor?" I said I would be glad to.

Rocketship leaving

"Well," he continued, "One of my first cooks got a letter from a buddy in New Mexico or somewhere down there. And this buddy has inside information that these atomic and rocket fellows are about to launch a space ship to set up some space stations along the way to a project on the moon or Mars, I forget which.

"Well, his dope is that M-K and Kiewit and a few other contractors are forming a joint venture to establish the route and set up reconnaissance camps for an inter-planet power development. You know my record, and how I could really get that kind of a show on the road for them. If you'll just say a few words to the right people . . .

"But say, maybe you'd better not. You know how shorthanded I am now, and I would sure lose some men if they heard of this!"



EASY DOES IT for Darrell Yeary (left), crane operator for Madonna Construction Co. as he jockeys a pipe section into place under the watchful eye of Leonard Hawkins, state inspector. A twist on the usual method of culvert installation is shown right. Contractor has permission to set pipe sections with inside tongue upstream. When joints are mortared and backfill is compacted, culvert will be tight.

Old railroad right-of-way provides sub-grade for modern highway

FOR $1,020,000, Madonna Construction Co. of San Luis Obispo, Calif., has the job of four-laning a 6-mi. stretch of U. S. 101 between Zaca and Wigmore, about 25 mi. south of Santa Maria. The names of the terminal stations are important; they are former station points of the old Pacific Coast Railroad, long since torn up, and the old right-of-way is being used for part of the new alignment.

Grading is uphill job

Work this spring has been heavy grading and work on the one principal structure, located at the south end of the job. For the grading, Madonna is using 4 Terra Cobras, and they have an uphill job — hauls as long as 10,000 ft. for some 30,000 cu. yd. of material. As an index to the amount of earthmoving involved, the job includes 1,666,500 sta. yd. of overhaul.

Structural work accounts for some $22,000 or more of the contract, all wrapped up in a culvert installation replacing the old 2-lane bridge at Zaca. The bridge is sound, but the highway profile has to be raised to ease a grade beyond the creek. So the 4 new lanes will be carried on embankment over a 3-barrel concrete culvert installation 214 ft. long.

Concrete pipe sections are 8 ft. long and have an inside diameter of 84 in. With walls 8 in. thick, the overall dimension comes to 100 in. The sections are brought by truck from United Concrete Pipe Corp. in Baldwin Park, near Los Angeles, a haul of about 160 mi. A crawler tractor rolls the sections up on cribbing on the creek bank so that slings may be passed, the truck crane hooks on, and the sections are swung into place.

Streambed preparation to receive the culvert has been at a minimum. For the most part, light grading has been enough. Natural materials are suitable in quality. Specifications for backfill require either flooding or tamping. The standard is placement of 4-ft. lifts for flooding, 4-in. lifts for tamping. The Madonna crew will probably flood this installation.

The roughest part of the structural work is yet to come. This will be the chore of removing the old bridge. It's a solid concrete structure, county-built some 20 yr. ago. Previous experience with similar structures has shown that powder alone won't turn the trick; and a wrecking ball provides the final answer.

For California's Division of Highways, Lee Bunce is resident engineer. His inspectors include Leonard Hawkins (structures), Don Bleak, Joe Evans, Bob Hensley, John Campbell, and Dyer Campbell.

John Silvera is superintendent for Madonna Construction Co., with Don Eichner as assistant. Leonard Cole is carpenter foreman and Earl Blair is mechanic.

Canada plans dams

CANADA plans a long-range construction program for nine dams on the Upper Columbia River in the interior of British Columbia. The first unit in the project would be a 600-ft.-high, $400,000,000 dam at Mica Creek, about 250 mi. east of Vancouver. Construction on this dam is expected to start in 18 months and be completed within 7 yr.

A JOB OF STEEL ERECTION, and . . .

Simple and economical solution worked out when prime and erection sub put their heads together at Nimbus — Winston-Johnson and Bigge Crane & Rigging use unorthodox trick

THE PROBLEM centered in the setting of four main girders for the powerhouse roof deck framing. These girders, 60 ft. long and 7 ft. deep, weigh 12 to 13 tons each. A concrete slab 19½ in. thick is placed on top of the structural steel to create a working deck flush with the switchyard to the north and with the service bridge across the top of the dam to the south.

The original plan for setting the girders called for the use of two cranes, available on the job, working from the upstream and downstream sides of the powerhouse. The elevation of the deck of the powerhouse is 132.0, while the upstream apron is at el. 79.0 and the downstream tailrace adjacent to the powerhouse is at el. 50.0. (*Western Construction*, March 1953, pp. 47-52.) With a 90-ft. boom on one crane and a 100-ft. boom and 20-ft. jib on the other, the procedure would have been fairly routine. However, all work on the dam and upstream and downstream aprons, except for the final closure section, was completed two months before it was desirable to erect the structural steel. To eliminate unnecessary pumping operations in the cofferdammed area, pumps were pulled and the water allowed to rise, making it impossible to follow the original erection plan described above.

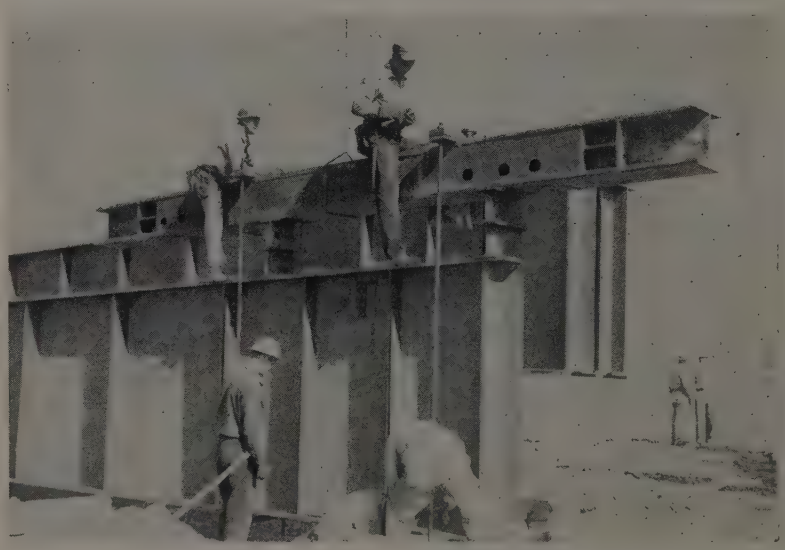
By this time, backfill had been placed on the abutment side of the powerhouse up to the deck elevation, creating the switchyard area which was available for the use of erection equipment. The four girders were to be set at distances of 30, 60, 77 and 105 ft. from the wall of the powerhouse adjacent to this area. Neither a single crane nor two cranes working in tandem could reach far enough with the load involved to set all of the girders. The design of the framing would allow nothing larger than a 20-ton truck crane on the completed deck making it impractical to attempt building out from one side as erection proceeded. Moreover, since closure of the dam had not been accomplished, no equipment could be brought in on the river end of the powerhouse. The solution appeared to be the use of a guy derrick set up inside the powerhouse. The base of this derrick would have been located at el. 72.0, the top of completed interior concrete just below the scroll case floor elevation. Girders could be fed to this derrick by a crane in the switchyard.

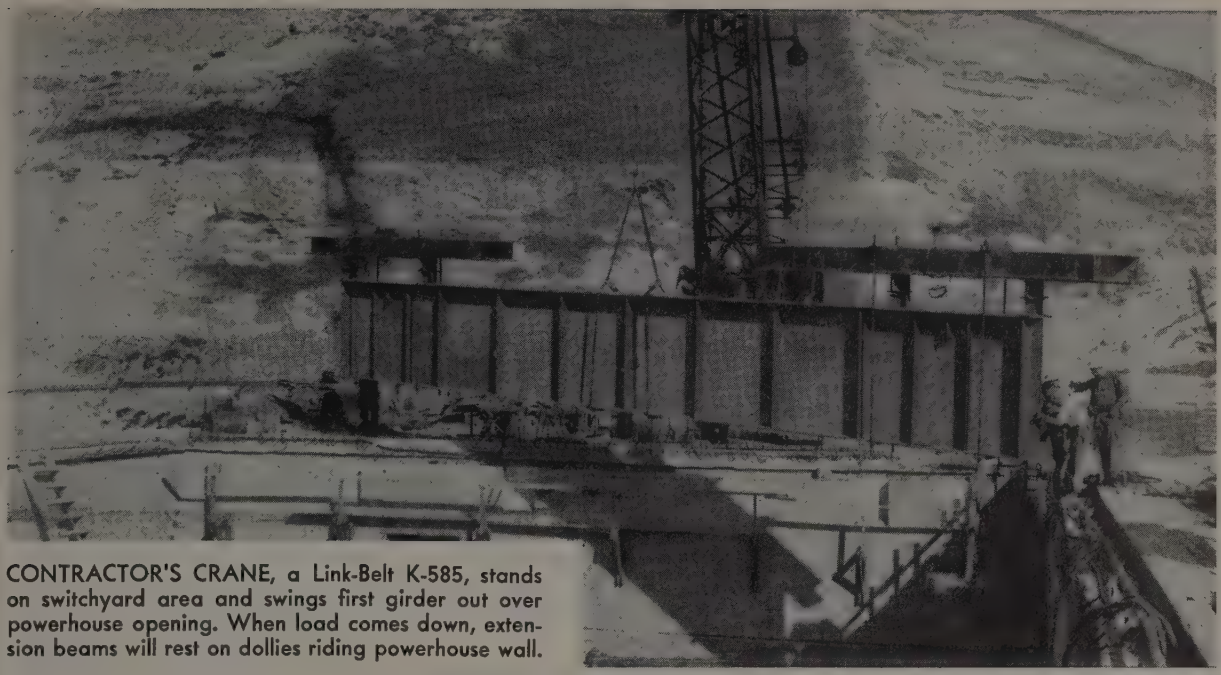
. . . HOW IT WAS DONE

An alternative procedure was decided on after a study of the problem by contractor's and subcontractor's men. Extension beams and spacer blocks, fabricated from scrap material in the shop, were temporarily attached to the top of both ends of the girder to be set. The beams were secured to the girder by 1¼-in. bolts 10 ft. long, extending down both sides of the girder and connected to plates across the top of the beam and across the bottom of the girder. These extension beams projected over the upstream and downstream walls of the powerhouse where 4-wheeled heavy rigging dollies could be set beneath their outer ends. The spacer blocks between extension beam and girder were of such depth that the girder was raised above its final level sufficiently to clear the anchor bolts at either end. Hand winches were set at the river end of the powerhouse and connected to the two dollies.

Nimbus Dam and power plant is a $6,000,000 project being built under direction of the Buerau of Reclamation. Contractors for the project are Winston-Johnson, a joint venture of Winston Bros. Company and Al Johnson Construction Co., both of Minneapolis, Minn. Project manager is A. T. "Ab" Evans. General superintendent is E. W. Danielsen; and project engineer, J. W. Fondahl. Structural steel was furnished by Independent Iron Works of Oakland, Calif., and erected by Bigge Crane & Rigging Co., also of Oakland. Superintendent for Bigge is Bert Sandberg, and structural ironworker foreman is Al Walters.

IRONWORKERS rig up the first girder with extension beams as erection operation gets under way. (Two girders visible in background are still on semi-trailer.) Note build-up of extension, making box section resistant to crushing.





CONTRACTOR'S CRANE, a Link-Belt K-585, stands on switchyard area and swings first girder out over powerhouse opening. When load comes down, extension beams will rest on dollies riding powerhouse wall.

ROLLING HOME, first girder (right) is winched along wall by hand crabs. It is passing over bearing plates for next girder and will be seated on plate in pilaster that is only partly visible here.

IN POSITION (below), girder has been raised off dollies by a pair of 15-ton Simplex step jacks. Now it will be let down on bearing plates. Crane will pick up extension beams and return them to switchyard for rigging to next girder.

REMAINING STEEL FRAMING is set by crane (below) once girders are placed. Extension beams and dollies were used only for three girders. The fourth, only 30 ft. from powerhouse wall at switchyard, was set directly by the crane. Total time for girders: 8 hr.

RUN-OFF FORECASTS
1954 water supply in the West

Surveys of Western snowpack show meager supply in Southwest, virtual drought in New Mexico and Colorado — Good margin in Northwest — Reservoir storage generally above past 10-yr. average at start of spring run-off, except in drought areas

By CLYDE E. HOUSTON
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and

HOMER J. STOCKWELL
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PROSPECTIVE WATER supplies for western United States in 1954 vary from ample supplies and possible floods on the northern section of the Columbia Basin to an extreme water shortage on the Rio Grande in Colorado and New Mexico. This is the latest summary of water supply conditions as prepared by the U. S. Soil Conservation Service, based on observations on nearly 1,200 snow courses in the mountain areas of the west.[1]

This brief analysis of April 1 snow surveys, again presented by *Western Construction*, shows a wide range of run-off in prospect for irrigation power generation, and municipal and industrial use.

Water shortage continues

The water shortage of the Rio Grande drainage is particularly critical with a combination of low snow cover and lack of reservoir storage. This situation has developed through a series of years of deficient run-off. Although run-off will be slightly more than during other recent dry years of 1950, 1951 and 1953, total water supply will be less in New Mexico. This pattern of low prospective run-off extends to a lesser extent through to central Colorado, southeastern Utah, and Arizona. Record spring storms during the latter part of March materially improved the outlook for the Salt River in Arizona. Reservoir storage was increased 250,000 ac. ft. and soil moisture conditions are good. The storm did not reach the watershed of the Gila River. Previously, record low streamflows were expected.

In Utah, supply will be near average with some shortage in the Bountiful-Farmington area of north central Utah.

Nevada snow storage is very spotty. It ranges from about one-third of normal in the north to near normal in the Sierra Nevada.

The snow cover on the Columbia River Watershed as a whole is heavier than in 1948. However, it is only remotely possible to have a re-occurrence of the late snow melt and spring rains of that year which produced the record flood flows of 1948. Heaviest snowfall has been in northern Idaho, Montana, and southern British Columbia, and on the east slope of the Northern Cascade Mountains. Other sections of this basin, in southern Idaho, northern Nevada and southeastern Oregon, have been extremely deficient in snowfall during the winter months and summer streamflow will be short. Water supply in most of Oregon will be generally good. Seasonal snow accumulation is normal and 90% of last year.

The following forecasts of streamflow for the major rivers of the West for the April-September 1954 period will indicate general watershed conditions at the start of the run-off season. The flow of the Columbia at The Dalles, 123% of normal; Colorado near Grand Canyon, 67%; Upper Missouri River and tributaries will average about 110%; Platte River and tributaries, about 65%; and, Rio Grande, about 50%.

Storage in irrigation reservoirs is generally above the past ten-year average except in the drought areas of Colorado and New Mexico.

In the following paragraphs the water supply situation is briefly outlined for each state. Charts indicating current status of reservoir storage and a map showing approximate run-off summarizes the outlook for the coming season.

ARIZONA

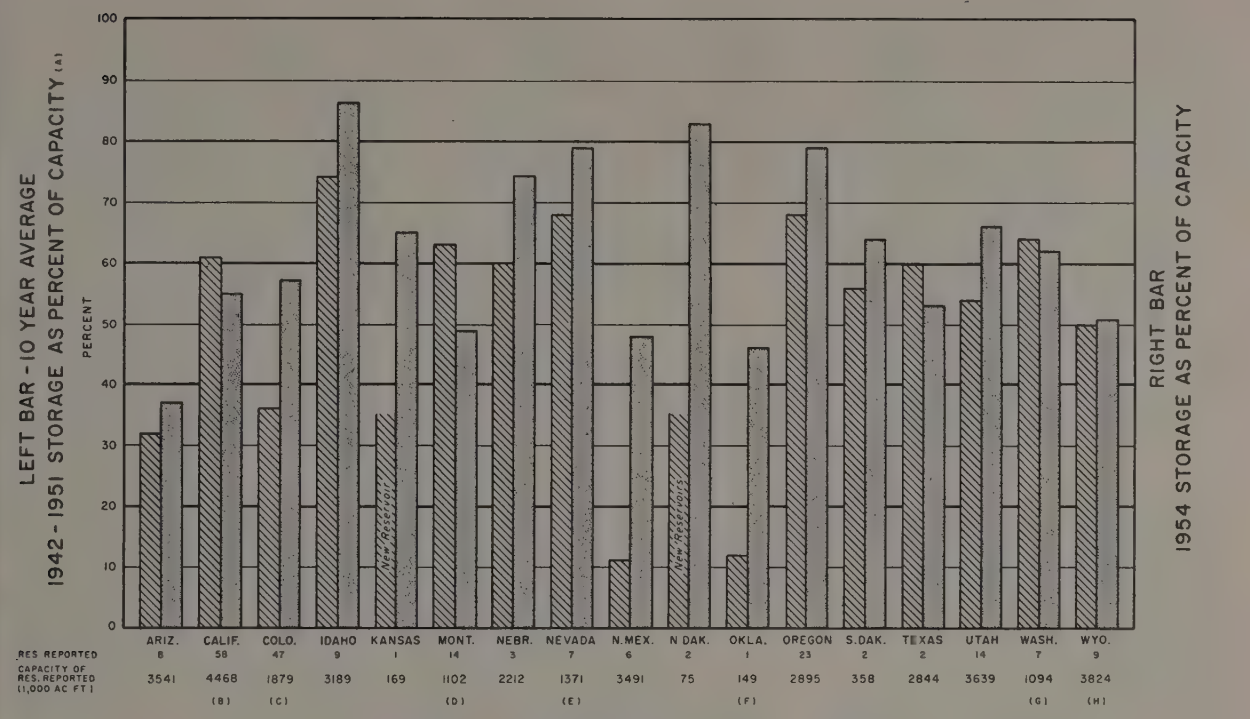
Water prospects on the Salt-Verde system are fairly good, but the out-

[1] *The Soil Conservation Service is the Federal coordinating agency of snow surveys conducted by its staff and many cooperators, including the Bureau of Reclamation, Forest Service, National Park Service, Geological Survey, various departments of the several western states, irrigation districts, power companies, and others.*

The California State Division of Water Resources conducts and coordinates snow surveys in that state, while the British Columbia Department of Lands and Forests, Water Rights Branch, has charge of the snow surveys in that province.

The U. S. Weather Bureau makes Westwide Water Supply Forecasts at more than 320 gauging stations, such forecasts being estimated principally on the basis of measurement of precipitation. The Weather Bureau forecasts are for the water year (October-September inclusive), whereas snow survey forecasts are always for the irrigation season only.

SNOW MEASUREMENTS are made in the same location in the mountains (left) from year to year. These men are measuring carefully the location of the next sampling point in the snow course. (Right) Examining and testing snow sampling equipment before leaving for the snow course.



RESERVOIR STORAGE AS OF APRIL 1, 1954

Explanation: (a) Most state averages for reported reservoirs are for full 10-yr. period, but in a few cases reservoirs having shorter records are included. (b) Does not include Shasta, Millerton, or Pine Flat reservoirs (combined capacity 6,120,500 acre-feet); April 1 combined storage 4,191,530 acre-feet. (c) Does not include John Martin Reservoir (capacity 655,000 acre-feet); April 1 storage 15,600 acre-feet. (d) Does not include Fort Peck Reservoir (capacity 19,000,000 acre-feet); April 1 storage 12,180,000 acre-feet. Does not include Flathead Lake (capacity 1,791,000 acre-feet); April 1 storage 616,100 acre-feet. Does not include Hungry Horse Reservoir (capacity 3,500,000 acre-feet); April 1 storage 1,947,000 acre-feet. (e) Does not include Lake Mead (capacity 27,217,000 acre-feet); April 1 storage 15,701,000 acre-feet. (f) New reservoir in 1945. (g) Does not include Roosevelt Lake (capacity 5,172,000 acre-feet); April 1 storage 2,933,000 acre-feet. (h) Does not include Boysen Reservoir (capacity 758,000 acre-feet); April 1 storage 382,100 acre-feet.

CORRECTION: Graphed values (bar heights) for states of Colorado, New Mexico, Oklahoma, and Texas are in error. In each case, values for right and left bars should be reversed; e.g., for New Mexico 10-yr. average storage is 48% of capacity; and 1954 storage is 11%.

look for the Gila-Frisco is poor. Moisture from the storm of March 22-24 did not reach into the Gila drainage sufficiently to make up the existing deficiency. This storm was a record for this time of year, exceeding all late storms back to 1905, and resulted in a more optimistic outlook for water on the Salt-Verde area. Prior to the storm all streams were expected to establish record low flows that would probably not have been equalled for many years. Present outlook, entirely due to this storm, is for median conditions.

The Gila area, particularly the San Carlos project west of Florence, still faces an extreme shortage of water. The 40,000 ac. ft. of water produced by this storm, and perhaps 10,000 additional that can be anticipated, will not serve to carry the project for long. There are 100,000 acres within the project. The balance of water needed will have to come from pumps located in the already over-developed ground water basin in Pinal County.

BRITISH COLUMBIA

According to the Water Rights Branch of Provincial Department of Lands and Forests, most snow courses in the Columbia, Kootenay, Similkameen, and Skagit basin in British Columbia have snow water contents which are by far the heaviest ever recorded for this time of year. Observers in these areas report no sign of thawing, little run-off and continued cool weather. The results of their measurements reveal that a deep snow pack of low density exists which indicates that the snow has not begun to ripen in preparation for the spring thaw. The soil mantle under the snow is generally reported as unfrozen but well primed with moisture.

Largest run-off on record

The April to September run-off in these areas is predicted to be from 30% to 50% above the ten-year normal and if this actually occurs, will result in most cases with the largest run-off on record. Consequently a serious flood potential now exists and a gradual well ordered snow melt will be necessary to avoid peak discharges.

Snow packs in Okanagan basin, however, are near normal and an inflow to Okanagan Lake is expected to be about 15% below normal. This area can anticipate good water supplies from snow melt.

CALIFORNIA

The California Division of Water Resources reported that the water supply in California will be near or above normal north of the latitude of Oroville, slightly below normal in the remainder of the Central Valley and southern Lahontan areas and considerably below normal in the Santa Clara and central coastal and south coastal areas.

The snow pack averages slightly less than one year ago in the Cascade Mountains and the northern Sierra Nevada and is greater than one year ago on the watersheds south of the Stanislaus River. The water content determined by snow course measurements varies from 80% of normal on the Yuba, American, and Mokelumne River Watersheds, to an average of about 105% of normal on the Upper Sacramento and Tule River Watersheds. Normal or above normal snowmelt run-off is expected in streams of the north coastal area and in the Upper Sacramento River in the Central Valley area. In the remainder of the Central Valley area, snowmelt run-off may be expected to vary between 92 and 72% of the 50-yr. normal in the Feather and American rivers.

Storage in California reservoirs utilized for conservation is above normal for April 1 except in the south coastal area. With normal conditions, such reservoirs on streams tributary to the Central Valley area may be expected to fill during the snowmelt period.

Run-off during the six-month period ending March 31, 1954, has been below normal on streams other than those in the northern part of the north coastal area and on the Upper Sacramento and Napa rivers.

Predicated on estimated recharge and average conditions of draft, groundwater levels throughout the state in the fall of 1954 will in general be lower than those of 1953. Measurements made during March indicate that lowering in groundwater levels is generally prevalent in the important groundwater basins. Rises in groundwater levels were reported from a few locations in the San Francisco Bay, south coastal, and Central Valley areas, and generally over the central coastal areas.

COLORADO

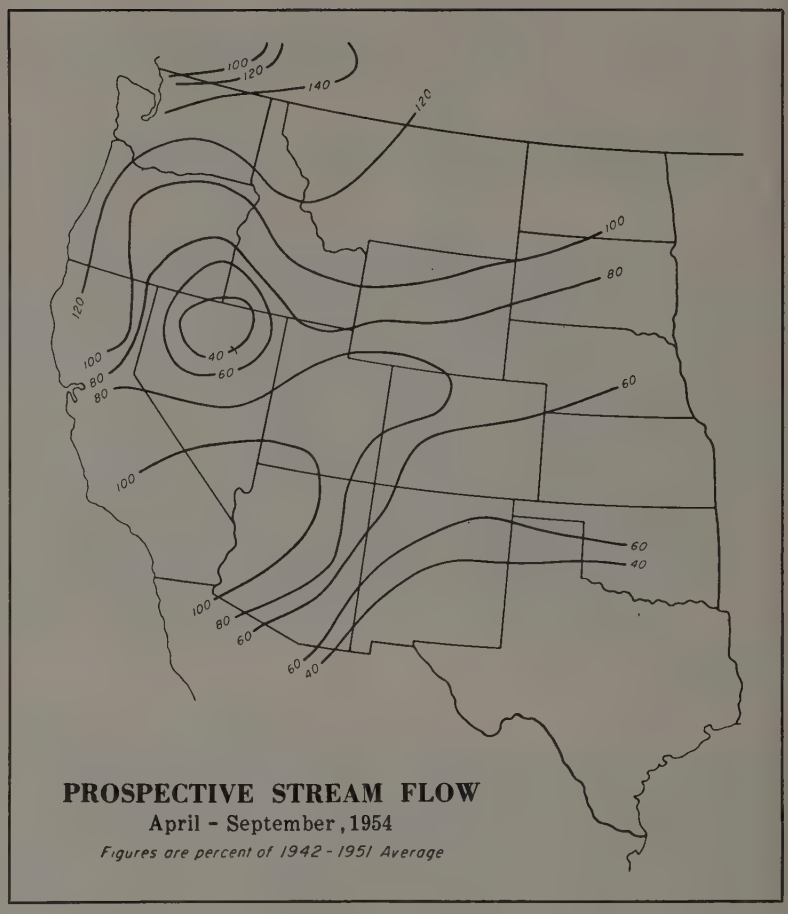
Summer discharge of all streams originating in the mountains of Colorado will be less than normal in 1954. Precipitation at high elevations was extremely deficient during the fall months. Seasonal snow accumulation has been below normal. Snow water content on high elevation courses ranged from 70% of normal to near normal as of April 1. All medium and low elevation courses were less than 75% of normal. Summer run-off on the Rio Grande, Colorado, and Arkansas rivers and their major tributaries is expected to be in the range of 60 to 70% of normal. Some South Platte tributaries, the North Platte and Laramie rivers will have slightly higher summer run-off.

Soil moisture conditions in irrigated areas are fair to poor east of the Continental Divide and fair to good on the west slope of Colorado. Storage in irrigation reservoirs is substantially below a year ago and is below the past 10-yr. average. Water shortage may be expected in all areas except where there is a considerable amount of supplemental water available as in the Northern Colorado Conservancy District. Most critical shortages are expected on the lower Arkansas and on the Rio Grande.

IDAHO

Northern Idaho Rivers have a record snow pack with excellent water supplies forecast for 1954. Serious flood potentials exist on the Kootenai, Clearwater, Spokane, and Pend Oreille Rivers. The most vulnerable flood plains are along the Kootenai River which has the greatest snow pack ever recorded since snow surveys began on the watershed in 1937. With normal spring conditions this river is expected to peak at 100,000 sec. ft. as measured near Leonia, Idaho. Serious flood damage can result when the river goes over 90,000 sec. ft.

In southern Idaho, prospective water supplies are poor as a result of a light snow pack. Prospects for the southern tributaries to the Snake River vary from 22 to 41% below normal.



PROSPECTIVE STREAM FLOW
April - September, 1954
Figures are percent of 1942 - 1951 Average

MONTANA

The 1954 snow pack over the Columbia River Basin in Montana is exceptionally heavy this season. The Kootenai River Basin has a record snow pack and a flood potential exists. On the Flathead Basin the snow pack is 20% greater than in 1953. The South Fork of the Flathead should flow 2,710,000 ac. ft. of water from April through September, or 120% average. The Flathead at Polson should reach 8,747,000 ac. ft. for the April-September period or 125% average. The Clark Fork River above Missoula is short of snow cover this season and is expected to flow 90% average. The Bitterroot River has a fair snow pack and is anticipated to flow 107% average this season.

The Upper Missouri Basin in Montana has an average snow cover except for the Marias, Teton and Sun Rivers. These streams reflect the Columbia Basin conditions with a snow pack much higher than last season and 174, 163, and 132% of the 6- to 15-yr. average respectively. A flood potential on these streams could be realized under adverse precipitation and temperature conditions early in the run-off season.

The Yellowstone River Basin through Montana has approximately a 115% average snow pack which should produce a fair water supply from April through September. The Clark Fork of the Yellowstone has below normal snow cover and is expected to flow approximately 82% average from April through September.

NEVADA

Nevada's outlook for 1954 water supplies from snowmelt is spotty. Snow stored water throughout the state ranges from very poor in the north to fair in the central section and excellent in the southern section. Along the Humboldt tributaries, streams can be expected to flow from 40 to 80% normal while the main stem will flow about 50% normal. Run-off into Nevada from the east central Sierra will range from 75% in the north to 85% normal in the south.

Users of snow fed streams in the southern desert section of the state can expect as high as 150% normal flow. October through March streamflow at key stations on the Humboldt and eastern Sierra was 90 and 100% normal respectively. In general, groundwater levels are below normal.

April 1 reservoir storage in seven important reservoirs was 79% of capacity and 115% of the past 10-yr. average.

NEW MEXICO

The water supply outlook for New Mexico is possibly the worst in recent years. Streamflow is expected to be slightly higher in the Rio Grande than for the years 1950, 1951 and 1953. However, storage in irrigation reservoirs is extremely low. Total reservoir storage and expected streamflow combined will equal less than one-half of the normal irrigation water demand. Pumping will be used to help alleviate the shortage in the Mesilla Valley.

Precipitation in valley areas has been negligible and soils are extremely dry. Similar conditions exist along the Pecos except that reservoir storage is slightly better than for the Rio Grande. Soils in the Carlsbad and Roswell districts are extremely dry.

OREGON

Water supply outlook for 1954 in Oregon is fair to excellent. Near average streamflow is expected except in the far eastern portion of the state. Water supplies will be adequate in western Oregon and in all areas where storage water is available. Some eastern Oregon lands will have late season shortages unless adequate May-June rains are received.

Water content of mountain snow averages 102% of normal based on 106 long-record, snow courses and is 89% of last year. Reservoired water in 23 reporting reservoirs is 116% of average. Mountain soils are well wetted except in the extreme eastern part of the state.

UTAH

There are two small areas in the state which have very poor run-off prospects. The Farmington-Bountiful area of the central Wasatch front in northern Utah has the poorest snow cover since the drought year of 1934. In southern Utah on the East Fork Sevier River-Escalante River, in spite of the heavy snow accumulation of March, snow cover is still only 50% of average, although about one-third more than last year. Elsewhere in the state, run-off prospects vary from 60 to 134% of average.

Water users having river storage rights will in general have sufficient water for their needs during the coming summer. Water users having only natural flow rights in those sections of the state other than southwestern Utah and the Uinta Basin, can anticipate below average late season water supplies, unless a very cold, wet spring develops.

Holdover storage in fourteen reporting reservoirs is 66% of capacity. This compares with 54% of capacity for the period 1942-1951.

WASHINGTON

The Chelan River in Washington has the greatest snow pack measured in the 24 years that the snow course network has been in operation. This snow pack is 62% above normal. Other rivers in Washington also have a very heavy snow pack and water supply prospects are excellent throughout the state.

A flood potential exists on the main stem of the Columbia River as measured near The Dalles, Oregon. This major river also has a record snow pack that is expected to produce an unregulated peak of 760,000 sec. ft. Unusually heavy spring rains and a late snowmelt could raise this peak to a serious magnitude.

WYOMING

The snow cover throughout the State of Wyoming ranges from above normal in the Snake River Basin, Wind River Basin, Big Horn and Yellowstone Park Watersheds to 80% of normal in the North Platte, Laramie River and Pole Mountain drainage areas. This is the second year in succession that the southern part of the state has experienced a sub-normal snow pack and the seriousness is now increased by the reduced storage in the North Platte and Laramie River reservoirs.

Above normal temperatures indicate an increase, from winter melt, in the soil storage of late last fall. However, a soil deficit remains over most of the state and this will reduce the snow melt run-off indicated by the snow surveys.

TRI-DAM PROJECT: How it stands

THE SECOND legislative chapter for the Tri-Dam Project in 1954 was written March 1 with introduction of Senate Bill 3040 by Senator Thomas H. Kuchel of California. Developments leading up to a bill introduced in the House of Representatives early in January were reviewed in *Western Construction* for February 1954, pp. 68-69.

The Tri-Dam Project, planned and designed by the Oakdale and South San Joaquin irrigation districts in California, calls for construction of three dams and hydroelectric plants on the Stanislaus River, a Sierra Nevada tributary of the San Joaquin River in the central part of the state. A bond issue secured entirely by power revenues (contracted with Pacific Gas & Electric Co.) was contemplated to finance construction, and bids were taken for the work a year ago. However, a sudden rise in bond interest rates forced rejection of bids and resulted in determination by the irrigation districts to seek federal assistance.

A close look at the House bill introduced by Representative Leroy Johnson in January convinced proponents of the Tri-Dam Project that modifications were in order. The resulting proposed legislation, now before the Senate Committee on Interior and Insular Affairs, "nails down" provisions for repayment of a federal loan to a greater degree. It is expected that a similar bill will replace the one already introduced in the House.

Essentially, S. 3040 authorizes appropriation of two sums of money, (1) an interest-free loan of not more than $10,370,000 for construction of project features allocable to irrigation and, (2) a grant of an amount determined to represent the value of project features allocable to flood control. An overall provision ties the two together, by specifying that if the sum of the two amounts exceeds $10,370,000, then the excess shall be credited on the loan.

Appropriations under the act are conditional upon the signing of a joint contract by the irrigation districts. Following is a summary of the contract provisions.

The loan shall be disbursed to pay construction costs only to the extent that the districts cannot finance the work from anticipated power revenues. The districts must sell the maximum amount of revenue bonds that can be amortized by project power revenues. An exception here relates to certain power revenues only indirectly resulting from construction of the project.

The Tri-Dam Project will enhance operation of existing Melones and Stanislaus power plants, and it is incremental revenues from these plants that must be pledged for repayment of the federal loan. In the case of Melones, incremental revenues after June 16, 1977, are pledged in an annual amount of $136,000. For Stanislaus, the date is December 16, 1985, and the annual amount is $604,000.

With reference to the flood control grant, contract provision must be made to assure that operation of the project by the irrigation districts will produce the flood control benefits on which the grant is based.

REPORTS from the COURTS

By HOWARD S. BURNSIDE, Attorney and Registered Engineer

Responsibility for faulty plans

THE CITY OF Albuquerque, New Mexico, has encountered a troublesome situation with its Rio Grande sewer line that involves the intricate problem of responsibility for the failure of the line to meet performance specifications. The facts of this matter, which has not reached the state of litigation, provide a convenient medium for viewing the obligations of the various parties involved in a very common type of construction problem.

It has been claimed that the specifications for joints in the Rio Grande sewer line were faulty with the result that ground-water infiltration at certain places exceeds by threefold the rate allowed by the construction contract. A "cold mastic" joint-sealing compound was used by the contractor in the defective section and was changed to another material by the design engineers during the course of work.

Starting at the point where a completed job fails to perform as required, an owner may find that his architect or engineer places blame upon the construction contractor who, in turn, may point to the architect or material manufacturer for faulty design or fabrication; and the manufacturer may then attack the judgment of the architect for the particular application or the skill of the contractor in making the application. In any event, it would seem that the owner would be entitled to recover damages from someone but this is not necessarily so.

Can the owner recover from the contractor? If the contractor has followed the plans and specifications furnished to him and on which he bid then he cannot be held responsible after completion of the work for loss or damage from defective plans. This assumes that he has performed his work carefully and has not made any express warranties as to the sufficiency of the plans.(1) Contractors do not ordinarily make such warranties, but if the question arises the construction contract will be examined, including the fine print which is deemed to have been read.

Can the owner recover from the manufacturer of a brand item or an item manufactured to the owner's specifications? Ordinarily he cannot. If it can be shown that the manufacturer or his representative made an express warranty with respect to the use of the material on the particular job, then the answer would be yes. Or if it could be shown under certain circumstances that the manufacturer was negligent in the manufacturing operation and put out a defective product there might be liability. But these possibilities are rather remote.

Can the owner recover from the architect or designer where a particular design has proven inadequate? The answer is a much qualified "no." When an architect or designer undertakes a job, he does not "automatically" or impliedly guarantee a satisfactory result nor assure against miscalculations in the work.(2) Furthermore, he is not liable for errors of judgment, this latitude being permitted in most professional pursuits. However, if it may be shown that the damage or loss resulted from his unskilfulness or negligence he may be held responsible. Judgments against architects and designers are not common, but this does not mean they are non-existent.

In considering the various situations involved, it should be noted that as to the contractor, the designer is the agent of the owner but as between themselves, the designer and the owner are independent contractors. This is the usual case where plans are prepared at the owner's request which are used by the construction contractor to perform his work. This twofold aspect of the designer may be applicable where fault is found in the plans. The contractor may successfully contend that he did his work properly and the owner is not entitled to recover against him because the owner is himself responsible for the acts of his agent, the designer. Thereafter the designer may successfully contend that the mistake, if any, was an error of judgment which any designer exercising care and skill might make and therefore he is not liable on his contract with the owner.

Cases dealing with contractor's responsibilities and architect's liability for defective plans have been reported from time to time in these pages.(3) In New Mexico the case of Staley v. New has dealt with the contractor's responsibility.(4)

(1) 9 Am Jur 20.
(2) 3 Am Jur 1011.
(3) *Western Construction*, July 1953, p 91. July 1952, p. 80.
(4) *Staley v. New*, 250 P. 2d 893.

Oral agreement cannot change written contract

AN EXCAVATING CONTRACTOR bought a dirt loader on a conditional sale contract which provided that the written contract embodied all the terms of the agreement. He also signed a promissory note and when he failed to make monthly payments the seller sued to recover the amount of the note.

In his pleadings the contractor alleged that in addition to the written contract he had orally agreed with the salesman that he would take the loader solely for trial and demonstration to others and if after several months he didn't wish to buy it then he would pay only one monthly installment, and the seller would pick up the machine.

At the trial of case the contractor prevailed but the judgment was reversed on appeal to the Supreme Court of Washington which directed that judgment be entered for the seller.[1] The court applied the rule that evidence of an oral agreement is not admissible for the purpose of varying the terms of a written contract.

Thus if the contractor had in fact made such an oral agreement he was barred from proving it in a situation where the written contract was a purchase agreement with installment payments. This rule is founded on the elementary principle that written contracts must be accorded certain sanctity otherwise anyone could avoid the effects of his agreements by alleging and offering to prove that there was an oral agreement which modified or nullified the written contract.

The foregoing statement is a simplification of a very complicated part of the law of evidence and the rule stated is not to be applied wholesale because there are many exceptions, e.g., where the written contract is ambiguous or uncertain, or an oral modification has been fully performed.

[1] *Nelson Equipment Co. v. Goodman*, 254 P. 2d 727.

Notes

"I AM entirely in accord with the principle of preserving the sanctity of written contracts, but this applies only when the contract represents the intent of the parties. Where errors occur, clerical, typographical, or otherwise, of course, a contract can be reformed to show the true intent of the parties.[1] In order to prove such mistake and avoid the effects of this written contract, the evidence must be clear and convincing; that is, it must be such that there is no serious nor substantial doubt what the true intent is."[2]

[1] 76 *C. J. S., Reformation of Instruments* 25h.
[2] *Paulsen v. Commbs (Utah)* 253 P. 2d 621.

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WESTERN CONSTRUCTION NEWS

ARIZONA

PHOENIX SUBDIVISION—Construction has started on a $3,000,000 subdivision at a 72-ac. site in north Phoenix by the Staggs Construction Co. Some 286 homes in the $9,000 to $10,000 class and a big shopping center are being built.

JET RUNWAY — A 7,200-ft. long runway with 250 ft. of concrete blast pads at each end has been opened at Williams Air Force Base, a jet fighter pilot training school. The project also included 3,500 ft. of asphaltic-concrete taxiways. The Arizona Sand and Rock Co. built the $1,105,000 project in 10 months.

TUCSON HIGHWAY — Congress has been asked to consider adding the sum of $1,600,000 to the Department of Defense budget to build a 4-lane highway to the Tucson Municipal Airport and aircraft plant located there.

INTERCHANGE PROGRESS—Construction of a traffic interchange at the junction of U. S. 80, 89 and State 84 in Tucson was 66% complete at last report. Scheduled completion date is November 15, 1954. At that time, the new Tucson Expressway will be open to traffic for its entire length of 5.8 mi. The roadway portion of this contract is 4-lane, PCC, divided highway. It is being built by San Xavier Rock & Sand Co., Tucson, under a $578,191 contract. Highway Department personnel on the job include H. H. Wessel, engineer of plans; R. H. Hoffman, bridge engineer; and William N. Price, senior resident engineer on the job.

RECENT MAJOR CONTRACT AWARDS and low bids in Arizona include a low bid of $178,707 by **W. J. Henson** of Prescott for 4.5 mi. of grading and draining roadway 22 mi. southeast of Globe over the new alignment of U. S. 70, and also a low bid of $267,781 for 3.9 mi. of grading and draining roadway, beginning 26 mi. southeast of Globe on the same highway. **E. C. Mohamed** of Phoenix submitted a low bid of $196,746 for 1 mi. of street improvement in the city of Phoenix.

San Xavier Rock & Sand Co. of

Cooperative studies made on Arizona tourist travel

STUDIES OF TOURIST travel in Arizona are being made cooperatively by the Arizona State Highway Department, the Bureau of Public Roads, and the National Park Service. Implications of these studies are considered on page 49 of this issue. The following paragraphs summarize survey procedures and results to date.

Grand Canyon National Park was the locale of a questionnaire study conducted in February. Because of the season, only South Rim traffic could be considered; during a one-week period 455 questionnaires were distributed and 424 returned.

Findings covered gates of entry to and exit from the park, including the fact that 18% of all park traffic leav "after hours," when the ranger is duty. Purpose of the trip, natural was found to be mainly that of plea ure (80%), and a combination f business and pleasure was claimed by another 19% of respondents. However, 87% of park visits were more or less incidental, resulting from proximity of the Grand Canyon to a predetermined route of travel.

Average auto occupancy (winter trip) was 2.9, with 51.1% of cars having 2 people. Motel accommodations were found most popular by travelers the night before entering the par' (88.8%) and the night after (83.8%) A surprising number of traveler have friends and relatives in the vi cinity; the homes of such peopl rated second in the classification (3.0% and 5.7%).

States of origin were California (11%), Illinois (8%), Minnesota (8%), Michigan (6%), and Iowa (4%). The remaining 63% were scattered among 39 other states, Canada, Hawaii and two foreign countries.

The average park visitor was engaged in a 5,100-mi. trip extending over 26 days. Estimated trip expenditure was $600, including $115 spent in Arizona during a 7-day traverse. These figures are "per car party." Expenditures in the park alone averaged $12 per person, and $35 per party.

Follow-up studies will be conducted and a survey covering an entire year will be prepared after 1954.

CHECKING OVER the first Grand Canyon Travel Survey report are (from left) *J. W. Dewey* and *C. A. Worthke*, of the Arizona Highway Department. *J. A. Killalee* (right) adds the viewpoint of the San Francisco office of Bureau of Public Roads.

200 cubic yards an hour on a 1500-foot haul

Cat® DW20 Tractors and W20 Wagons are key units in the earthmoving spread of Geo. Bennett Construction Co., Kansas City, Kansas.

Loaded by the dragline, one of these machines handles 18 cubic yards of material and makes 11 to 12 quarter-mile round trips to the fill per hour. On a construction job near Turner, Kansas, three DW20-W20 units moved 25,584 yards of earth in five working days.

The Bennett Co. also has Caterpillar DW21s, D8s, D7s and Scrapers in its big yellow fleet. Mr. Bennett says: "I have been using Cat machines since 1920. They've been tough and rugged and have held up better than any competitive product I know of."

The fast-moving DW20 Tractor, with its 225-HP Caterpillar Engine, furnishes perfectly matched power for the W20 Wagon. The wagon itself is built to outperform and outlast any other hauling unit in its class. It's engineered for the job, with weight evenly distributed between tractor and wagon tires. Hydraulic ram dumping gives the operator accurate control. And the generous size of the hopper offers a good target for the shovel.

Get actual production figures from your Caterpillar Dealer, nearby for information and service. He'll demonstrate right on your job, where you can compare cycle times with other equipment. Call him today.

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Tucson submitted a low bid of $124,-703 for a 4-span steel girder bridge and graded roadway approaches on a new alignment of U. S. 80, 30 mi. southeast of Tucson. **Wallace and Wallace** of Phoenix submitted a low bid of $168,813 for 4.9 mi. of subgrade seal and surfacing U. S. 66 near Ashfork.

CALIFORNIA

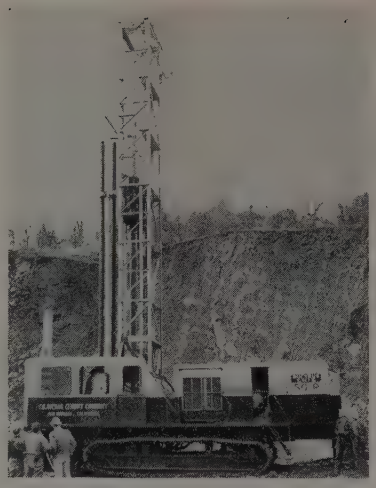
FOLSOM DAM—The sum of $14,-000,000 has been set aside in a $410,-000,000 flood control and navigation projects bill by the House Appropriations Committee for the next fiscal year. This amount would push the project well toward completion, according to Col. William J. Ely, Sacramento district engineer for the Corps of Engineers. This would leave about $6,000,000 worth of work remaining before the dam is finished.

CONSTRUCTION on the $2,000,000 City National Bank building in Beverly Hills began in April with completion expected by the end of the year. The 4-story structure will include about 40,000 sq. ft. of office space and more than 35,000 ft. of off-street parking in ground level and subsurface parking areas. A 2-lane covered drive with drive-in bank windows will be built to take care of drive-in customers.

PLANS AND SPECIFICATIONS for $4,000,000 worth of improvements to the San Francisco-Oakand Bay Bridge are virtually complete, according to Frank B. Durkee, state director of Public Works. Improvements have been broken down into five projects, which include revision of four connections to Yerba Buena and Treasure Islands, dredging and drainage structures for widening of the toll plaza and its approaches, extension of the overhead structure carrying traffic to and from the Port of Oakland, surfacing of new toll lanes, and revision of existing toll lanes to provide for driver's side only collections. Other contemplated work on the bridge was described in *Western Construction*—March 1954, p. 66.

A NEW POWER substation in Yuba County is scheduled to be built next summer by the Pacific Gas and Electric Co. for $2,665,000. Active construction of concrete foundations for transformers, circuit breakers, and other new equipment was scheduled to start May 1.

SACRAMENTO SUBDIVISION—A parcel of 234 ac. of farm land in Sacramento has been sold for $850,000 for subdivision to the firm of Heraty & Gannon. This firm intends to invest from $20,000,000 to $30,000,000 in a 1,000-lot subdivision, a ranch type hotel-motel, and a mile-long shopping area.



LARGEST IN THE WORLD

One of the largest industrial rotary drills in the world, a 54-ton Model 50-R Bucyrus-Erie, has gone into operation at the San Andreas, Calif., plant of Calaveras Cement Co. There are 10 in operation, but this is the only one in the West.

E. M. Barker, vice president of Calaveras, had this to say: "We are completely satisfied with the operations of the drill. It is living up to all of our expectations. Our operators are very well pleased with it."

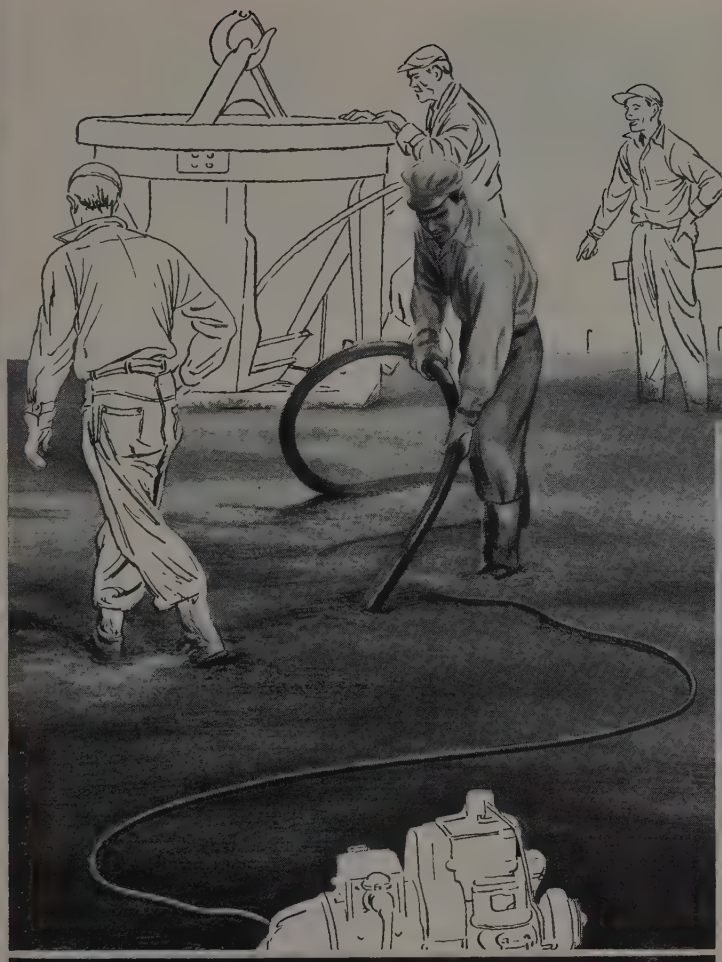
NEW HIGH SCHOOL—Construction of a $3,500,000 high school in the northern section of El Monte is expected to begin soon. Scheduled to be built are an administration building, a cafeteria, a library, dressing rooms, classrooms, and a gymnasium.

RELOCATION OF ROADS made necessary by construction of Monticello Dam (*Western Construction*—August 1953, pp. 82-83) will take $5,-550,000, according to R. P. O'Neill, Napa County road engineer.

FAIR OAKS BRIDGE—Construction of a $383,000 bridge over the American River at Fair Oaks was expected to start in May, according to Arthur L. Kiefer, Sacramento County engineer. The bridge will have a 28-ft.-wide roadway and be 1,000 ft. long. Kiefer estimated that the bridge would take 300 days to finish.

NEW STATE BUILDING—A bill has been introduced in the legislature to provide for construction of a 4-story State Department of Employment building in Los Angeles at a cost of $2,750,000.

SAN ANTONIO DAM—The mayors of four San Gabriel Valley communities which will receive flood control protection from a multi-million dollar dam in San Antonio Canyon



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Your Vibrator Is As Important As The Man Behind It

Of primary importance in vibrating concrete is the operator—he alone controls the quality of his work. Of equal importance is the selection of the right vibrator for the right job. That's where CP can be of help! Whatever the conditions, there's a CP Vibrator suited to the specific job requirements. The complete line of CP Vibrators includes seven different Pneumatic and High Frequency Electric Vibrators in one and two-man types and in frequency ranges to 10,000 VPM. For more details write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

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AERIAL PHOTO looking westerly across the spillway section of Whittier Narrows Dam shows work in progress on central embankment and floodway channel.

New contract let on Whittier Narrows work

WHITTIER NARROWS PROJECT—Bids were opened recently for the construction of the west embankment and outlet works on the Rio Hondo portion of the Whittier Narrows Project in Los Angeles County. A. Teichert & Sons and M. J. Bevanda, a joint venture, was apparent low bidder with a bid of $3,088,946. Work, scheduled for completion in the fall of 1955, was supposed to begin around May 1. The entire project is now about 60% complete. The dam is scheduled to be in operation before the winter season of 1955-56.

Principal structure on the project is an earthfill dam 55 ft. above stream bed. The crest, which will be about 14,960 ft. long, will hold back reservoir of 35,000 acre feet.

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helped turn the earth to start the project. A federal allocation of $2,500,000 to carry on the work during the fiscal year of 1954-55 has been granted along with assurance of additional funds to follow.

HYDRO POWER PROJECT—The United Water Conservation District of Santa Paula opened 11 bids for construction of Santa Felicia Dam (*Western Construction* — February 1954, p. 67) in April. A joint venture of Macco Corp., D & H Construction Co., and M. H. Hasler Construction Co. submitted a low bid of $3,534,825 for the job, which must be completed not later than November 1, 1955. This bid was more than $1,000,000 lower than the engineers' estimate.

STATE COLLEGE BUILDINGS—The State Assembly has added almost $13,000,000 worth of state college buildings to the state budget for the next fiscal year.

DREDGING has begun near Carlsbad to remove 4,000,000 cu. yd. of silt at the San Diego Gas & Electric Company's Encina Hydroelectric generating plant. The project, scheduled to take 7 months, will cost $1,800,000. The job was planned to provide sea water to cool four 100,000-kw. generating units which will eventually be placed in operation at the plant.

A NEW PROJECTS OFFICE of the Corps of Engineers has been established at Castle Air Force Base to replace the former office at Fort Ord. Knute Hansston, formerly assistant projects engineer at the South Projects office, has been designated acting projects engineer at the new location, which will be known as the Valley Projects Office.

A SEWAGE SETTLING BASIN, to be built at a cost of $521,600 near the north border of Griffith Park in Los Angeles, has been approved by the City Council.

RECENT MAJOR CONTRACT AWARDS and low bids in California include a low bid of $1,926,724 submitted by **Gordon H. Ball & San Ramon Valley Land Co. & John Delphia** of Berkeley for 5.4 mi. of grading and paving a 4-lane divided highway, and three bridges near Salinas. **James I. Barnes Construction Co.** of Santa Monica has received a $3,941,700 award for construction of the Reseda High School in Los Angeles. **Bingham Construction Co.** of Sacramento submitted a low bid of $118,030 for construction of an outfall sewer and treatment plant at Lincoln.

N. W. Brown of Redding submitted a low bid of $368,696 for 2.5 mi. of grading and surfacing roadway near Weaverville. **Charles L. Burch & Sons** of El Monte submitted a low bid of $117,175 for 1,520 ft. of sanitary sewer in East Pasadena. **Clements Construction Co.** of Hayward submitted a low bid of $125,135 for resurfacing 10.8 mi. on U. S. 97 in Siskiyou County. **Crown Construction Co.** of Los Angeles received a $1,116,000 award for the construction of Pueblo Del Rio Extension of low rent housing, Part 2, in Los Angeles. **D & E Corporation** of Beverly Hills received a $1,328,000 award for construction of 164 frame, stucco dwellings in Bellflower. **John Delphia** of Patterson received a $218,670 award for construction of the San Rafael approach to the San Rafael-Richmond bridge.

Eaton & Smith, San Francisco, submitted a low bid of $193,442 for 3.1 mi. of grading and untreated rock surfacing on S. R. 29-D in Tehama County. **George E. France, Inc.** of Visalia received a $143,917 award for grading and surfacing 7.9 mi. of S. R. 190 in Inyo County. **Fredrickson & Watson Construction Co.** of Oakland submitted two low bids, one of $686,678 for grading and surfacing 3.7 mi. of U. S. 99 in Shasta County, and one of $587,778 for grading and surfacing Rte. 3-D in Tehama County. **Gallagher & Burk Inc.** of Oakland submitted a low bid of $262,875 for a steel girder and concrete slab bridge and 0.3 mi. of grading and surfacing near Pittsburg.

Granite Construction Co. of Watsonville submitted three low bids, one of $267,810 for a reinforced concrete bridge 37 mi. south of Monterey, one of $193,343 for grading and surfacing 3 mi. on S. R. 140 near Mariposa, and one of $175,434 for construction of sanitary sewers in Fresno. **Griffith Company** of Los Angeles submitted two low bids: $1,544,688 for 17.4 mi. of grading and surfacing Rte. 31-B and C in San Bernardino County, and one of $742,858 for 3.4 mi. grading and paving near Carpinteria. **J. E. Haddock, Ltd.** of Pasadena submitted a low bid of $3,135,123 for 1.4 mi. of the Harbor (eight lane divided) Freeway in Los Angeles. **Macco Corp., Morrison-Knudsen Co., Inc., River Construction Corp.** submitted a low bid of $777,777 for 5.1 mi. of grading, two new bridges, and two bridges to be widened near Eureka.

McCammon - Wunderlich Co. of Palo Alto submitted a low bid of $737,303 for 6.7 mi. of grading and structures in Del Norte County. **Mercer, Fraser Co. and Mercer, Fraser Gas Co. Inc.** of Eureka submitted a low bid of $129,974 for 20.0 mi. of grading and surfacing in Mendocino and Humboldt counties. **Nomel-**

lini **Construction Co.** of Stockton submitted a low bid of $115,577 for grading and surfacing 3 mi. of S. R. 4 near Holt, San Joaquin County. **Opdyke & Butler** and **Tucker Construction Co.** of Sacramento submitted a low bid of $254,783 for 39 portable classrooms in Sacramento. **Robert E. L. Parker Company** submitted two low bids, one of $196,967 for grading and surfacing 4.7 mi. of San Bernardino County, and one of $283,873 for grading and surfacing 1.6 mi. of additional lanes on Rte. 19 and 77-B, Los Angeles County.

J. A. Payton of Riverside submitted a low bid of $317,747 for 1.9 mi. grading and surfacing on Rte. 199-A, San Diego County. **Rice Brothers, Inc.** of Marysville submited a low bid of $579,385 for grading and surfacing 5.2 mi. in Shasta County. **N. M. Saliba Company** of Los Angeles received a $124,897 award for construction of an undercrossing and 0.4 mi. of grading and surfacing near Maywood, Los Angeles County. **Ralph B. Slaughter** of Julian received a $266,614 award for 2.1 mi. of grading and surfacing and one concrete bridge near Indio. **L. C. Smith Company** of San Mateo submitted a low bid of $504,481 for grading and surfacing 4 mi. and constructing a concrete bridge on S. R. 1 in San Mateo County. **Stolte Inc.** of Oakland submitted a low bid of $852,-517 for installation of three 55,000-kw. turbines and a switchyard at the Folsom Dam.

Transocean Engineering Corp. of Hayward submitted a low bid of $227,-764 for grading, placing base material, and seal coating 11.4 mi. near the Napa-Lake County line. **Ukropina, Polich, Kral and John Ukropina** of San Gabriel submitted a low bid of $815,459 for grading and surfacing 2.5 mi. of the Elvas Freeway and connecting ramps near Sacramento. **Volpa Brothers** of Fresno submitted a low bid of $270,262 for 7.7 mi. of grading and surfacing near Corcoran, Kings County. **L. B. Wells Construction Co.** of Visalia submitted a low bid of $155,587 for grading and surfacing 4.6 mi. in Tulare County.

COLORADO

MORE HIGHWAY FUNDS — A supplemental highway budget of about $1,000,000 for additional construction has been approved by Governor Thornton. It was made possible through savings in construction costs on many recent projects. Projects scheduled to benefit by the new funds include a $300,000 addition to a grade separation, underpass, and highway through Castle Rock as part of U. S. 85-87; $240,000 for construction on U. S. 24 from Limon to Genoa; $145,000 for right-of-way purchase on U. S. 85; $170,000 for stabilization and oil surfacing on State 51 north of Wray; $100,000 for consruction on State 51 near Burlington; replacing five narrow bridges on U. S. 40 by culverts for $60,000; and $65.000 for construction of a new bridge in Debeque Canyon on U. S. 6.

TRINIDAD HOUSING—The first families have moved into a new 150-home housing project in Trinidad. This is the largest single home construction job in the history of the city. It was built by Utah Construction Co. for about $1,250,000. Job personnel included R. S. Hardie, job supervisor; Roy C. Douglas, project manager; Mathew H. Karcich, project engineer; and Vern Tyler, office manager.

MOFFAT TUNNEL — Denver will start receiving an average of 15,000 acre feet of water each year after a series of conduits bringing Western Slope water through the Moffat Tunnel is completed. The water, which should be available for use this summer, will come from the Ranch Creek watershed over Berthoud Pass.

LEGAL BARRIERS to construction of a $1,500,000 shopping center in east Denver have been removed by a court decision. Abe Perlmutter Construction Co. and the Farrey Brick Co.

Stiff wind, water tests given building panels

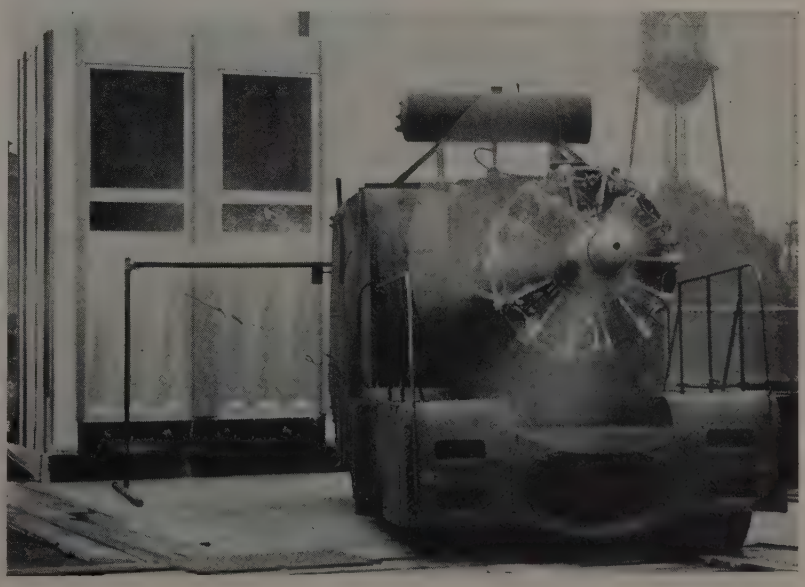
ENGINEERS AND CONSTRUCTION MEN like to know that the materials they work with have been satisfactorily tested for intended usages. An excellent example of this was conducted recently by Kawneer Co. engineers to test the storm endurance of the exterior window-wall panels for the new 25-story Equitable building now under construction in San Francisco.

About 1,600 aluminum panels 4 ft. 6 in. wide by 12 ft. high will be installed. They are to be bolted to stainless steel mullions and these in turn to the framework of the building. It was desired to test two aspects of the panels: (a) the vibrations that might be set up by wind as affecting the connections, and (b) the watertightness of the assembled units. A facsimile of a panel section of the new building was erected.

A 2,000-hp. aircraft engine mounted on a mobile test stand created a 60-mph. wind. Water squirting from a pipe stand produced the equivalent of 12-in. per hr. of rain. The combination of the two resulted in a hurricane blast. Deflection gages showed satisfactory results concerning vibration as did the lack of moisture behind the unit prove its watertightness.

Curtis Smith, vice president of the Dinwiddie Construction Co., general contractor on the building, prepared the test site. The panels were designed by W. B. Glynn and A. J. Loubet, successors to W. D. Peugh, architect. H. W. Lindholm, superintendent of construction for Equitable, and O. H. Windfield, vice president and general manager of the West Coast operations of Kawneer, supervised the tests and evaluation studies. Aluminum for the window-wall panels is furnished by Reynolds Aluminum Co.

HURRICANE BLAST produced by a 2,000-hp. aircraft engine was used to test storm endurance of aluminum exterior window-wall panels.



have a building permit for a 25,000-sq. ft. supermarket which will be key unit of the shopping center, when it is built.

AIRPLANE HANGARS—Bids have been asked for construction of a series of 50 interlocking T hangars at Stapleton Field in Denver, according to David Davis, airport director.

WATER FOR SUBURBS—Plans to bring water to suburban communities in the vicinity of Denver were advanced by John P. Elliott, a Denver consulting engineer, who has plans to bring about 70,000 acre feet of water a year across the mountains out of the Colorado River watershed. He estimates that construction of necessary dams, canals, and tunnels would cost about $25,000,000.

RECENT MAJOR CONTRACT AWARDS and low bids in Colorado include a low bid of $1,895,000 submitted by **C. H. Leavell & Co.** for construction of the state highway department administration building in Denver.

IDAHO

FUTURE HIGHWAY CONSTRUCTION on federal aid projects look good if present plans in Congress are approved and the money is actually appropriated. Two separate plans are under consideration, including a total of $9,024,000 for construction on primary, secondary, urban, and interstate highways within the state, and in addition a $2,160,000, 10-project program for building roads in the national forests within the state.

MICHAUD FLATS—A report from the Bureau of Reclamation recommending a $4,600,000 irrigation project at Michaud Flats has been received by Secretary of the Interior Douglas McKay. It would provide irrigation for 11,000 acres along the south side of the Snake River by diverting water from the American Falls Reservoir, supplemented by pumping ground water from 25 wells. During hearings on the project before a House Committee, representatives of the Bureau of Indian Affairs asked that an additional appropriation of $5,465,000 be added to the bill to authorize irrigation of 20,000 acres of Indian land near Michaud Flats.

WASHO TEST ROAD—Test traffic at the Washo Test Road in southeastern Idaho, which started on February 17 this year, will be carried on through May, according to a recent decision of the Highway Research Board. Routine observations of deflection under load, deformation, and the like will be carried on during this period. By then, traffic will have been

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REPORTS H. W. "JACK" HARTMANN, McDOUGAL-HARTMANN CO., PEORIA, ILLINOIS

The hard-working fleet of construction equipment owned by McDougal-Hartmann Co. includes tractors, 'dozers, scrapers, cranes, shovels, pavers, batching plants *and* Yellow Strand Wire Rope!

There are good reasons why Yellow Strand is the preferred brand for McDougal-Hartmann Co. as "Jack" Hartmann, Vice-President and General Manager of the company, will tell you:

"We first became acquainted with Yellow Strand more than twenty-five years ago and as yet, we have never found a fault in this wire rope. We've always been more than satisfied with the performance of Yellow Strand.

"Another reason we like Yellow Strand is the excellent service we get from our Broderick & Bascom distributor. In fact, he's setting up our Speedi-Service Plan right now. We're going to make full use of Speedi-Service!"

You can ask Jack Hartmann or any other veteran of the construction industry about Yellow Strand. You'll see why Yellow Strand is the *preferred* brand. Specify Yellow Strand on your next wire rope order and take advantage of Speedi-Service!

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FORT RANDALL DAM NEARS COMPLETION

Fort Randall Dam, being erected across the Missouri River at Pickstown, South Dakota by the Corps of Engineers, is now 75% completed. This photo shows earth-moving equipment placing fill in the final section of the earth-fill embankment. The dam was far enough along this winter to store snow run-off and spring rains.

operated during all seasons of the year except during the winter shutdown, within the limits of remaining funds available. Funds totaling about $650,000 have been contributed by the eleven Western States' highway departments, Territory of Alaska, the Bureau of Public Roads, truck and trailer manufacturers, and some petroleum companies to make the test possible. Test operations were described fully in *Western Construction* January 1953, pp. 79-82 and June 1953, p. 68.

Following the test shutdown, two or three months more will be devoted to special studies of pavement deflection under various loads, pavement components, and numerous correlary studies. After the Highway Research Board has completed its work, the test section will become part of the U. S. 191.

RECENT MAJOR CONTRACT AWARDS and low bids in Idaho include an award of $2,121,200 to the **Arrington Construction Co.** for construction of ground testing facilities for a protoype aircraft propulsion reactor near Idaho Falls. **Asphalt Paving & Construction Co., Inc.** of Boise received a contract award of $142,538 for grading and surfacing 1.1 mi. of the Payette Spur of the Old Oregon Trail. **Blaw-Knox Co.** of Pittsburgh received a multi-million dollar contract award for modification of the chemical-processing plant at the National Reactor Testing Station near Idaho Falls. **Heald & Christler, Inc.** of Cody, Wyo., submitted a low bid of $275,808 for relocation of S. R. 29 from Indian Creek to the Wyoming line. **Holmes Construction Co.** of Reyburn received a $134,424 award for 11.2 mi. of surfacing U. S. 30N in Caribou and Bear Lake counties.

Peter Kiewit Sons' Co. and **Le-Boeuf-Dougherty** of Sheridan submitted a low bid of $1,135,332 for construction of the first and main unit of the Sandpoint bridge in Northern Idaho. **Morrison-Knudsen Co., Inc.** and **J. A. Terteling & Sons, Inc.** of Boise submitted a low bid of $616,341 for apron extension at the Mountain Home A.F.B. **C. W. Watkins & Son** of Boise received a $47,157 award for construction of a 330-ft. precast concrete bridge and approaches in Canyon County.

MONTANA

ANOTHER OIL PIPELINE in Montana has started, according to William H. Tegtmeyer, president of the Oil Basin Pipeline Co. The line, which will have a daily capacity of 12,000 bbl., and be 8 in. in diameter, will extend from Laurel and Billings to Glendive. It will cost $5,350,000. Construction is expected to be completed before the end of summer.

CONSTRUCTION of an 8-story office building at Billings is expected to be started shortly. Bids were called for an April 28 opening. Cost of the reinforced concrete building, to be 85 by 140 ft. on an L-shaped plan, is estimated at $2,000,000.

FOREST HIGHWAY CONSTRUCTION in the state received a shot in the arm when $1,670,000 in federal funds was accepted by the State Highway Commission. Specific projects to be worked on include gravel surfacing 5.8 mi. of U. S. 2 near Nyack, $750,000; oil surface 13 mi. of U. S. 191 in West Gallatin Canyon, $275,000; plant-mix oil surface 2.6 mi. of U. S. 2 in Lincoln County, $55,000; grade and construct bridge on the Swan Valley Highway, $340,000; grade and build bridges on 8 mi. of the Gallatin Canyon Highway, $300,000; and grade 5.6 mi. of U. S. 93, $225,000. Meanwhile, Scott Hart, Montana highway engineer, called for a five-year construction program covering 2,350 mi. in 400 different projects for the sum of $68,000,000. He pointed out that even this is not enough, since the state's highway needs estimate lists $381,550,000 as the amount needed to bring the state's road system up to acceptable modern standards.

RECENT MAJOR CONTRACT AWARDS and low bids in Montana include two awards to **S. Birch & Sons Construction Co.**, one of $160,480 for 18.9 mi. of surfacing on the Harlowton-Moore highway, and one of $129,660 for 14.4 mi. of surfacing on the Armington-Lewistown highway. **Albert Lalonde Co.** of Sidney received two awards of $113,001 for 8.2 mi. of grading and surfacing in Roosevelt County and $135,027 for 6.8 mi. of grading and surfacing in Valley County. **Morrison-Knudsen Co., Inc.**, of Boise recevied a $735,000 award for construction of the Anaconda High School.

NEVADA

RENO LUXURY HOTEL—About 100 ac. of land on the outskirts of Reno is in the process of being acquired by Comstock Enterprises, Inc., a new Nevada corporation, which contemplates spending $7,500,000 in the construction of a 5-story, 400-room luxury hotel, a 100-unit motel, and a 9-hole golf course, tennis courts, swimming pool, and the like.

NELLIS AIR FORCE BASE has $2,276,500 in contracts scheduled for completion during 1954, including a jet field facility for $125,000 by George E. Miller, two maintenance hangars for $1,132,000 by J. H. Pomeroy & Co., three ammunition storage igloos for $96,700 also by Miller, a communications and electronic shop for $112,000 by Sierra Construction Co., and two runway extensions for $811,000 by Gibbons & Reed.

RECENT MAJOR CONTRACT AWARDS and low bids in Nevada include an award of $286,235 to **W. W. Clyde & Co.** of Springville for 26.1 mi. of grading and paving from Nye-Clark County line to Mountain Springs Summit. **Dodge Construction, Inc.** of Fallon received a $547,431 award for grading and surfacing 19.9 mi. in White Pine County. **Schwake Construction Co., Inc.** of Gardnerville received a $146,000 award for 5.9 mi. of grading and paving from Paradise Valley northeast in Hum-

boldt County. **T. G. K. Construction Co., Inc.** of Phoenix submitted a low bid of $2,227,700 for construction of a high school at Las Vegas.

NEW MEXICO

PECOS PROJECTS—The Board of Army Engineers has approved a plan calling for construction of four flood control and irrigation projects on the Pecos River in New Mexico and Texas. The first is Los Esteros Dam near Santa Rosa, a structure which would be 218 ft. high and would cost $5,724,000. The second project would be construction of levees and floodways near Pecos, Texas, at a cost to the federal government of $1,577,000, plus a cost to local residents of $315,000. The third is a levee diversion project for Artesia on Eagle Creek. Federal costs would be $465,500 and local interests would pay $136,500. The fourth project, returned to division and district engineers for further study, would have provided a $4,240,000 flood control project for Carlsbad.

HOME CONSTRUCTION in the northeast section of Albuquerque is well under way, according to Westphall and Davis, Albuquerque builders. The project, to cost $500,000, includes construction of some 1,200 homes in the subdivision.

LOGAN BRIDGE—Construction of a steel bridge across the Canadian River and approaches on U. S. 54 near Logan is well under way with steel stringers now going into place, according to the latest job report. The mileage included in the approaches (3.8) was necessary to find a spot that could be spanned economically. The present bridge is limited to 5 tons and its location was no good for a new span. Highway Department personnel on the project include W. E. Strohm, bridge engineer; N. R. Sack, assistant construction engineer; and Ben M. Long, resident engineer. J. H. & N. M. Monaghan & Associated Companies are contractors on the $593,750 job.

RECENT MAJOR CONTRACT AWARDS and low bids in New Mexico include an award of $194,555 to **Brown Contracting Co.** of Albuquerque for 3.6 mi. of excavation and grading on U. S. 66 between Albuquerque and Correo. **O. D. Cowart** of Albuquerque received a $191,167 award for 12.4 mi. of grading and surfacing on U. S. 85 from Albuquerque to Isleta. **O. D. Cowart & G. I. Martin** received a $164,752 award for 10.4 mi. of grading and surfacing from Estancia west on S. R. 55. **Haake Construction Co.** of Santa Fe received a $119,974 award for 6.1 mi. for grading and surfacing S. R. 65 from Las Vegas eastward. **Lembke-Clough & King Construction Co.** received a $3,000,000 award for construction of Western Skies Hotel near Albuquerque.

G. I. Martin of Albuquerque received a $170,198 award for 13.5 mi. of grading and surfacing S. R. 440 in Roosevelt County. **Skousen Construction Co.** of Albuquerque received a $386,495 award for 9.6 mi. of grading and surfacing S. R. 17 from Blanco east. **Skousen-Hise Contracting Co.** of Albuquerque received a $454,287 award for 14.5 mi. of grading and surfacing U. S. 85 in Mora County. **Strain & Brown** of San Angelo, Tex., submitted a low bid of $146,875 for repairs to the north-south runway at Clovis A.F.B. **Leslie Wheeler** of Albuquerque received a $113,849 award for 40.2 mi. of surfacing U. S. 66 on the Correo-Grants road.

OREGON

PORTLAND GARAGE—A 14-story building containing five full-block levels for automobile parking under a tower with 300 offices or hotel rooms, to be built at a cost of $10,500,000, has been proposed by local business men. John F. Jensen, Portland architect, is drawing up the plans.

TIMOTHY MEADOWS DAM—Construction on a general contract to build Timothy Meadows Dam for Portland General Electric Co. is expected to start about June 1 after the snows blanketing the area have all melted away. Preliminary work during the winter has been carried on as the weather has allowed. For instance, Morrison-Knudsen Co., Inc. is building about 8½ mi. of access roadway, Murray & Stanford have a contract to erect a concrete bridge across Shellrock Creek, and Harbert Brothers are clearing 75 ac. around the damsite. Total cost of the dam, including equipment, is estimated at $2,200,000.

A late report indicates that Morrison-Knudsen Co., Inc. submitted a low bid of $1,446,735 for construction of the dam itself.

PORTLAND HOTEL — Plans for building a $10,000,000, 1,000-unit luxury hotel in Portland have been announced by a local realtor. If financial arrangements are completed, construction will start this summer and the hotel will be ready for occupancy by the fall of 1955.

INTERSTATE BRIDGES — Plans of Oregon and Washington state highway engineers for a new bridge across the Columbia River at Vancouver were opposed by tugboat men, who demanded the proposed structures provide 200 ft. of vertical clearance and at least 1,000-ft. of horizontal clearance at a hearing held by Col. Thomas H. Lipscomb, Portland District Engineer of the Corps of Engineers.

R. H. Baldock, Oregon State Highway Engineer, offered a new plan calling for removing a middle pier of the present span and pushing up that section of the bridge to leave a vertical clearance of 77½ ft. in the middle of the 500-ft. center span. Under this

CATS GO TO SEA

A barge load of Caterpillar crawler tractors is checked over before leaving Peoria, Ill., on the first leg of an 8,000-mi. sea trip to Alaska to be used on the Haines to Fairbanks pipeline (*Western Construction*—March 1954, p. 96; January 1954, p. 104), being built by a joint venture of Williams Brothers Construction Co., McLaughlin, Inc., and Marwell Construction Co.

plan, the lift span would remain near the Washington shore and a new bridge would be built to duplicate the remodeled old bridge. He estimated rebuilding the old bridge would cost $1,300,000 and that about $700,000 would be added to the cost of the projected new bridge, making the total project cost $13,000,000.

Baldock rejected a suggestion that tunnels be driven under the river, saying that twin tunnels would cost $41,000,000 to build and it would cost much more to operate and maintain the bridges.

JOHN DAY DAM—A proposal has been advanced by the Portland General Electric Co. for public and private power utilities to go into partnership with the federal government for construction of the $300,000,000 John Day Dam upstream of The Dalles Dam on the Columbia River. The federal government would be asked to put up half of the construction money and would be repaid by the sale of power within 50 yr. Original Corps of Engineers' plans called for a dam 225 ft. high at the site. A proposal to raise that height to 292 ft. was opposed by many witnesses on the ground that a number of communities in Oregon and Washington would be flooded out by the reservoir.

BEND PIPELINE—Clearing operations have started in preparation for two sections of a 12-mi. pipeline from the Tumalo Creek intake to Bend. W. P. Drost, city water superintendent, says that about $140,000 will be available for that part of the work undertaken this year.

POWER ON THE LINE—Detroit and Big Cliff dams in the North Santiam River canyon near Salem are almost ready to put out power. The single generator at Big Cliff is scheduled to begin putting 18,000 kw. on the line in June. The two generators at Detroit, installed capacity of 100,000 kw., will be operated at peak periods, whereas Big Cliff's generator will run continuously.

RECENT MAJOR CONTRACT AWARDS and low bids in Oregon include an award of $186,814 to **Acme Construction Co.** of Eugene for 2.7 mi. of grading and paving and two bridges south of Springfield. **Donald M. Drake Co.** of Portland received a $213,816 award for construction of a bridge over the Tualatin River and grading and paving 0.7 mi. west of Tigard. **Erickson Paving Co.** of Seattle received a $166,724 award for 4.2 mi. of grading south from Estacada, Clackamas County. **J. W. Griggs** of Bend submitted a low bid of $162,489 for grading 3.6 mi. of the Cummins Peak road in Siuslaw National Forest. **E. C. Hall Co. & J. C. Compton Co.** of Portland received a $425,148 award for 9.7 mi. paving and 3,000 cu. yd. crushed material stockpiled on the

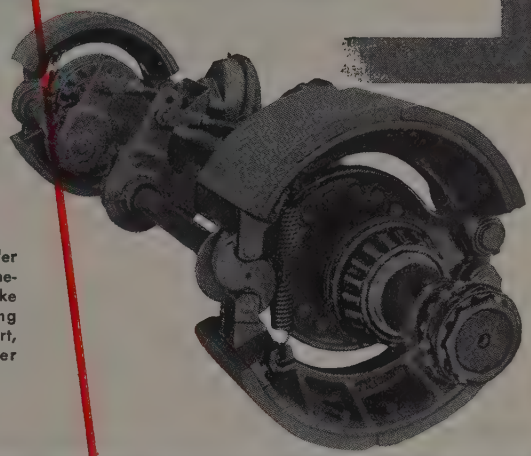
SHULER

Fuller Western District Branch to Distribute *SHULER* Steering and Trailer Axles

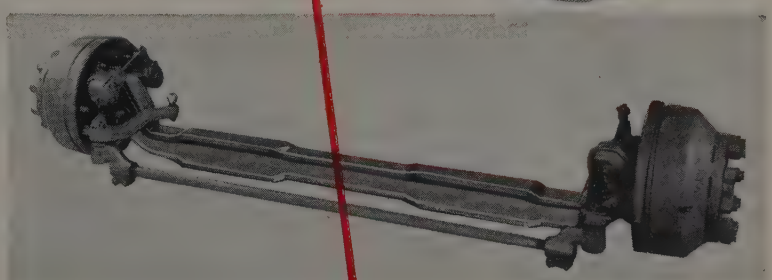
On March 1, Fuller Manufacturing Company's new Western District Branch—641 East 10th St., Oakland—will begin distribution of *Shuler Heavy Duty Steering Axles.* And on *April 1, Shuler Trailer Axles* will be added.

Immediate availability of Shuler spare parts and complete replacement units — for both truck and trailer axles—will be assured by a complete inventory at the Western District Branch.

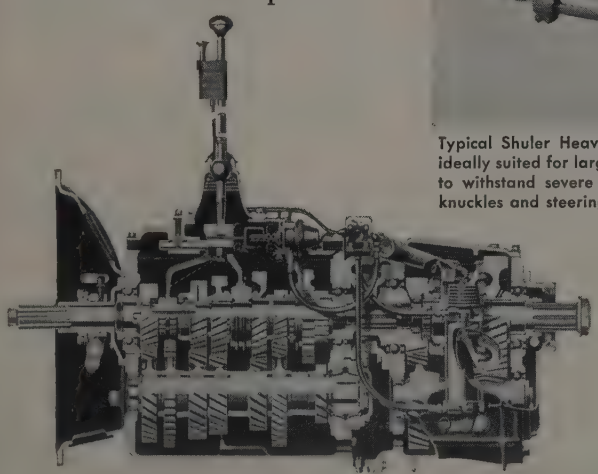
Sales will be made only on a wholesale basis. And for both on- and off-highway users of the 110 different models of Fuller Transmissions, Fuller parts and replacement units will be in constant readiness at the Western Branch headquarters—backed by complete follow-through from Fuller Service Representatives.



Typical features of Shuler Trailer Axles include one-piece coined "S" brake cams, new self-aligning outer cam shaft support, bolted-on brake spider and brake lining.



Typical Shuler Heavy-Duty Front Axle. Rated capacity from 8,000 lbs. through 18,000 lbs.—ideally suited for large, high-speed trucks and buses, as well as off-highway equipment. Designed to withstand severe punishment . . . offers oversize heat-treated steel forgings in the beam, knuckles and steering arms.



Fuller R-950-C ROADRANGER® Transmission (with overdrive)—10 speeds forward in 28% steps, *shifted by single lever.* No gear-splitting. More speed on hills; better control in traffic; faster round-trips.

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Unit Drop Forge Division, Milwaukee 1, Wis., Shuler Axle Co., Louisville, Ky. (Subsidiary), Western District Branch (Sales & Service—All Products), 641 E. 10th St., Oakland 6, Calif.

Pacific highway south from Sutherlin, Douglas County.

Hallett Construction Co. of Minn. and **Continental Co.** of Ohio submitted a low bid of $248,229 for construction of a 30-mi. section of the Detroit-Albany 230-kv. transmission line. **Linn-Lane Construction Co.** of Sweet Home submitted low bids of $144,683 and $169,633 on Schedules I and III for clearing and access road work for transmission lines in the Detroit area. **Parker-Schram Co.** of Portland received a $487,356 award for 7.4 mi. of grading and 7.1 mi. of paving on the Columbia River Highway north of St. Helens.

F. L. Somers & Geo. R. Stacey of Klamath Falls received a $709,346 award for 11.4 mi. of grading a section of the Pacific Highway 3 mi. south of Creswell to 7 mi. south of Cottage Grove. **Sterner Construction Co.** of Portland submitted a low bid of $676,738 for construction of an addition to Beaverton high school in Portland. **Porter W. Yett** received a $123,250 award for 2.9 mi. grading and paving near Beaverton and Metzger. **Young & Smith Construction Co.** of Grants Pass received a $245,900 award to construct three bridges over the Deschutes River and Fulton Canyon Creek on the Columbia River Highway.

UTAH

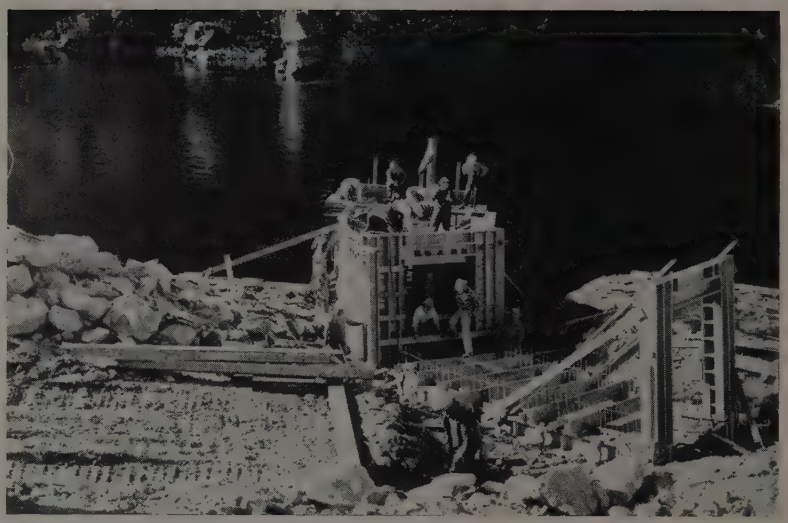
LOCAL OPPOSITION to a proposal to bypass U. S. 91 around the town of Washington has caused the State Road Commission to cancel the $800,000 project. A Commission spokesman said that the money can be used to equal advantage elsewhere without controversy.

BACKFILLING of a 3,000-ft. portion of Jordan River channel in Salt Lake City has been started. Part of the reclaimed land will be used for an addition to Riverside Park and part will be used for construcion of a new public school.

ATOMIC ENERGY COMMISSION plans include $1,215,000 worth of access roads during the next fiscal year, according to K. D. Nichols, AEC general manager. The funds would provide for 127 mi. of additional access roads to the uranium mining areas.

RECENT MAJOR CONTRACT AWARDS and low bids in Utah include a low bid of $812,000 submitted by **Christiansen Bros.** of Salt Lake City for a classroom building at Brigham Young University in Provo. **W. W. Clyde & Co.** of Springville submitted two low bids, one of $212,671 for grading and roadmix surfacing 4.6 mi. in Salt Lake County, and one of $110,265 for 2.1 mi. of plantmix surfacing on S. R. 106 in Davis County. **Thorn Construction Co., Inc.** of Springville submitted a low bid of $536,577 for 17.1 mi. of plantmix surfacing on U. S. 160, Monticello to Colorado state line, and also a low bid of $111,792 for 5.8 mi. of roadmix surfacing on S. R. 210, Salt Lake County.

Floyd S. Whiting of Murray submitted a low bid of $315,434 for 3.1 mi. of plantmix surfacing on U. S. 50 and 6, Utah County. **L. A. Young Construction Co.** of Richfield submitted a low bid of $121,923 for 3.0 mi. of road mix surfacing on S. R. 149, Jensen-Dinosaur Monument area.



SUBWAY ACCESS FOR ROSS POWERHOUSE

An enclosed passageway from the Skagit River boat landing is a final touch at Seattle City Light's new Ross Powerhouse (*Western Construction*—October 1952). Operating personnel now commute by boat from Diablo Dam, 4½ mi. downstream and walk the last 112 ft. in this structure. Inside dimensions of the completely buried passage are 6 x 8 ft.

WASHINGTON

WATER AND SEWER improvements to the tune of $1,775,000 have been recommended by the Yakima engineering firm of Gray & Osborne, which reported on the necessary work to the Puyallup City Council. Separate projects in the report include sewer extensions, installation of a storm and drainage system, construction of a sewage treatment plant, and increased water storage and pumping capacity.

HEAVIEST HIGHWAY CONSTRUCTION season in the history of the state is under way, according to W. A. Bugge, director of highways. It is expected that awards of highway construction contracts during 1954 will exceed the $44,000,000 in 1953 awards by quite a sum. Among the various counties scheduling projects are Grant, Adams, and Franklin under a total $6,333,000 appropriation. Walla Walla County plans to spend more than $50,000 in rebuilding and resurfacing 10 mi. of suburban streets and building two new culverts, according to B. Loyal Smith, county engineer.

EXTENSIVE home-building plans during 1954 in Kennewick and Pasco have been announced by local builders. Construction of $500,000 worth of two and three-bedroom homes in Kennewick will be undertaken by United Builders. Intermountain Mortgage Co. plans to build 180 homes in Pasco.

COWLITZ DAM STORY, ANOTHER CHAPTER—The U. S. Supreme Court has refused to review a Federal Power Commission order approving a hydroelectric development on the Cowlitz River in Lewis County by the City of Tacoma. This action leaves standing a lower court decision which approved the project. These dams were discussed in *Western Construction*—April 1954, p. 97 and January 1954, p. 81.

CITY LIGHT EXPANSION — An immediate program authorizing the expenditure of $1,400,000 for expansion of electrical distribution facilities in Seattle has been asked by Paul J. Raver, Seattle Department of Lighting Superintendent.

CANADIAN PIPELINE — The Trans Mountain Oil Pipeline Co. pipeline from Alberta to Vancouver, where a tank farm has been established near Burrard Inlet, has been

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VICTORTUBE "SPECIAL"	Abrasion, severe impact	Oilfield bits, rock bits	Acety. only
VICTOR TUNGSMOOTH	Thin cutting edges	Coal cutters, brick augers, pug mill knives, screw conveyors, farm tools	Acety. AC-DC Elec.
VICTORITE	Earth abrasion or sliding friction	Plowshares, cultivators, steel mill guides, cement chutes, shaft bearings, rolling mill guides	Acety. AC-DC Elec.
TUBE VICTORITE	Abrasion, impact	Plow points and farm tools	Acety. AC-DC Elec.
VICTORITE 1	Corrosion, heat, abrasion	Saw teeth, carbon scrapers, wire guides, rocker arms, steel mill applications	Acety. AC-DC Elec.
VICTORITE 6	Red heat, impact, corrosion and abrasion	Blanking, forming and trimming dies, cams, hot punches, pump shafts	Acety. AC-DC Elec.
VICTORITE 12	Heat, abrasion, impact	Saw blade inserts and other critical applications	Acety. AC-DC Elec.
VICTORITE CARBON ARC	High abrasion, thin deposit	Plowshares, lister shares, sweeps	Carb. arc Acety.
VICTORALLOY	Abrasion, severe impact	Tractor rollers, dredge pump impellers, bucket lips and teeth, rock crushers, steel mill wobblers, roll crushers	Acety. AC-DC Elec.
VICTORALLOY #1	High abrasion, medium impact	Bucket lips, rock crushers, Muller tires, gyratories	Acety. AC-DC Elec.
VICTORALLOY "A"	Angular shock, extreme impact, build-up	Clutch parts, gears, crusher plates, gyratory mantles, build-up for hardfacing	AC-DC Elec. only
VICTORALLOY "B"	Heavy impact, moderate abrasion	Tractor rollers and sprockets, shovel pads, plates, idlers, etc.	AC-DC Elec. only
VICTORALLOY "C"	High abrasion, moderate shock and impact	Tractor grousers, pressure rolls, crusher segments, roll crusher teeth	AC-DC Elec. only

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VA #2	Abrasion, impact, Multi-pass application	Steel mill applications
VA #3	Abrasion, light impact	Mill guides, crushers, dredge bushings
VA #4	Multiple layer build-up	Tractor rails, crane wheels, general build-up
VA #5	Heavy impact, abrasion	Tractor rollers, idlers, mine car wheels, sheave wheels
VA #6	Medium abrasion, high impact	Crane wheels, drums, roll necks
VA #7	Abrasion, high impact	Build-up for hardfacing
VA #8	Abrasion, medium impact	Dozer bits, roll crushers, scraper blades
VT #60	Extreme abrasion	Tool joints, grader blades, scraper blades, augers

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H-11

finished. Right-of-way has been obtained for a feeder line to the General Petroleum Corp. refinery now under construction at Ferndale, Wash. The company is planning further extension of a 20-in. pipeline to Burlington, Wash., and a 16-in. line to Marsh Point on Anacortes Island, where the Shell Oil Co. refinery is being built.

SAND POINT BRIDGE—The Washington Toll Bridge Authority has asked the Navy to relax its restrictions on construction of a $20,000,000 bridge across Lake Washington from Sand Point to Kirkland, a site favored by the authority's consulting engineer, Charles Andrew. Navy officials have agreed to consider the plans, and it was decided that all statements should be in Navy hands by May 1.

PRIEST RAPIDS—Northwest Congressmen have agreed to modifications to legislation which would make possible construction of Priest Rapids Dam on the Columbia River (*Western Construction*—March 1954, p. 91) by Grant County Public Utility District No. 2.

TANK FARM ADDITION — The Spokane County Planning Board has authorized the Carter Oil Co. to build $599,000 worth of facilities at the company's tank farm in Spokane. Project will include construction of 7 tanks with a capacity of 245,000 bbl. of petroleum products, a railroad tank car loading rack, a truck transport loading rack, a warehouse, a terminal office, and an ethyl blending plant. Refined petroleum will reach the site from Billings, Mont., by pipeline.

SKOKOMISH DAM—Surveys are under way by the Tacoma Public Utility Board to determine cost of a 285-ft. high by 500-ft.-long, rock-filled diversion dam on the South Fork of the Skokomish River. The facility will include an additional earthfill, 65 ft. high by 2,500 ft. long across a saddle along one side of the dam, and a 10-ft.-diameter, 4-mi.-long tunnel from the south fork reservoir. The project, estimated to provide 200,000,000 kw-hr, is estimated to cost about $14,000,000.

HIGH COST OF TOLL ROADS—The New York engineering firm of Cloverdale & Colpitts has told the Washington Toll Bridge Authority that it would cost $158,170,000 to build the proposed Tacoma-Seattle-Everett freeway. The firm recommended a toll of 85 cents be charged for the whole route, with lesser charges for shorter distances. There would be seven toll stations along the route.

RECENT MAJOR CONTRACT AWARDS and low bids in Washington include an award of $107,639 to **Associated Sand & Gravel Co.** of Everett, grading and surfacing 2.3 mi. in

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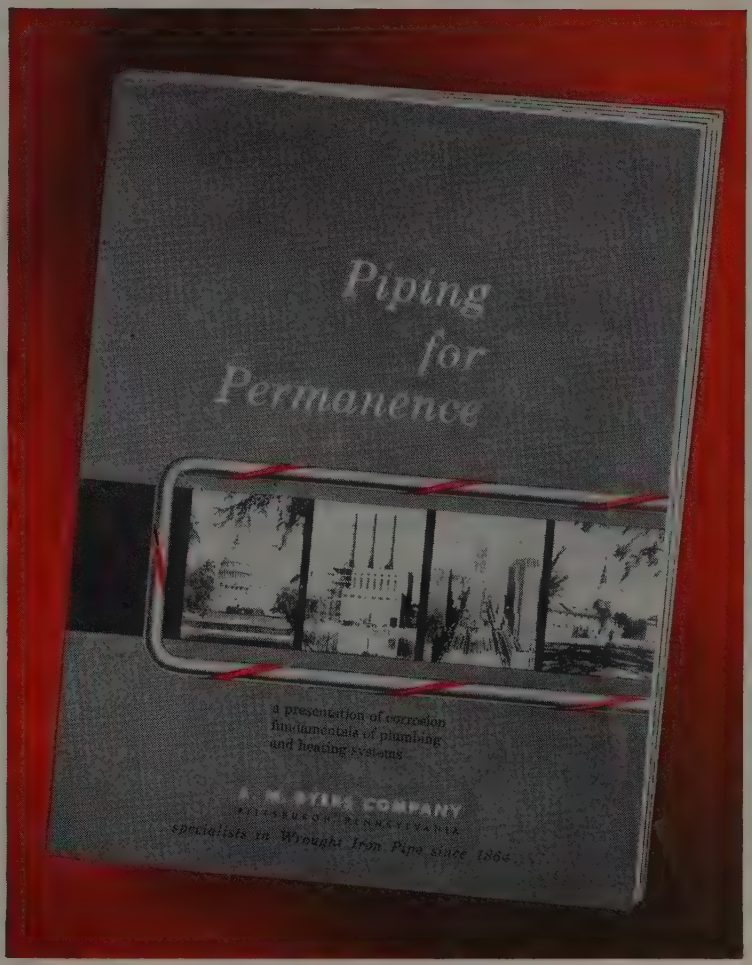

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Requisites of a piping system—brief review of piping material properties essential to long-life, economical service.

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CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

Everett. **Guy F. Atkinson Co., Ostrander Construction Co.** and **J. A. Jones Construction Co.** received a $2,057,080 award for installation of imbedded turbine parts, concrete work in the powerhouse, and construction of a 230-kv. switch structure for Units 9 to 14 at McNary Dam. **James I. Barnes Construction Co.** of Santa Monica submitted a low bid of $1,973,485 for construction of a double-cantilever maintenance hangar at Larson A.F.B. near Moses Lake.

Bennett-Campbell, Inc. of Seattle received a $1,549,274 award for the addition of four stories to the existing four-story Bon Marche department store in Seattle. **C & E Construction Co., Inc.** of Yakima received a $287,363 award for 4.4 mi. of grading and surfacing between Whitman and Lowden. **Chicago Bridge & Iron Co.** of Seattle submitted a low bid of $95,985 for construction of a 500,000-gal. elevated watertank in Seattle. **N. Fiorito Co.** of Seattle received a $132,211 award for stockpiling crushed aggregate along S. R. 12 from South Bend to the Palix River. **Lewis Construction Co.** of Seattle submitted a low bid of $1,974,900 for construction of a three-story, reinforced concrete, 100-bed hospital at Fairchild A.F.B.

McAtee & Heathe, Spokane, received $208,624 award for 19.8 mi. of grading and surfacing in Chelan, Douglas, and Grant counties. **Murphy Bros. Construction Co.** of Spokane received a $175,847 award for 3.5 mi. of grading and oil surfacing between St. John and Ewan. **Newland Construction Co.** of Everett submitted a low bid of $472,419 for construction of an office and storage building and a steel frame garage in Everett.

Purvis Construction Co. of Spokane received a $936,270 award for the Deaconess Hospital four-story addition. **P. L. Saddler** of Wenatchee received a $525,694 award for 8.4 mi. of grading and surfacing between Vantage and Beverly Flats. **John H. Sellen Construction Co.** of Seattle submitted a low bid of $295,921 for construction of a readiness hangar at McChord A.F.B.

WYOMING

AIRPORT CONSTRUCTION was scheduled to get underway early in May with a $1,300,000 runway extension job at Cheyenne's municipal airport, according to Maj. Henry Lloyd, Wyoming National Guard property and disbursing officer, who said the money for the project has been allocated directly to his office and he, in turn, will turn the funds over to the Omaha Division of the Corps of Engineers, who will be in charge of the work. Completion on the job is expected to take between eight months and a year. Construction at the Wheatland Municipal Airport, the Worland Airport, the Natrona County Airport, and the Lusk Airport has also been authorized.

GLENDO DAM—Douglas McKay, Secretary of the Interior, has recommended that Congress appropriate funds to build Glendo Dam, power plant, and reservoir on the North Platte River. The dam would be a 166-ft.-high, earth-fill structure with a reservoir of 800,000 ac. ft. capacity. Glendo Power Plant will have a capacity of 24,000 kw. and Fremont Canyon Power Plant, also in the plan, would produce 48,000 kw. Estimated cost of the project is $50,860,000. The project was authorized by Congress in 1944, but so far no funds have been appropriated for construction.

LARGEST contract letting in the state for almost a year took place in April when the Highway Commission opened bids on 20 road construction projects, estimated to cost $2,300,000. The projects include construction and other work on 168 mi. of road in 12 of the state's 23 counties, according to C. W. Beaver, plans and office engineer of the Commission.

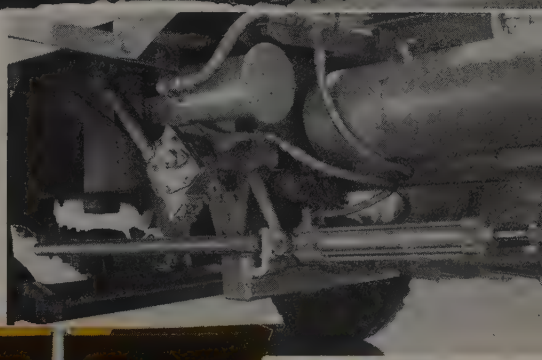
RECENT MAJOR CONTRACT AWARDS and low bids in Wyoming include a low bid of $164,002 by **Louis**

ON THE JOB ALL WAYS!

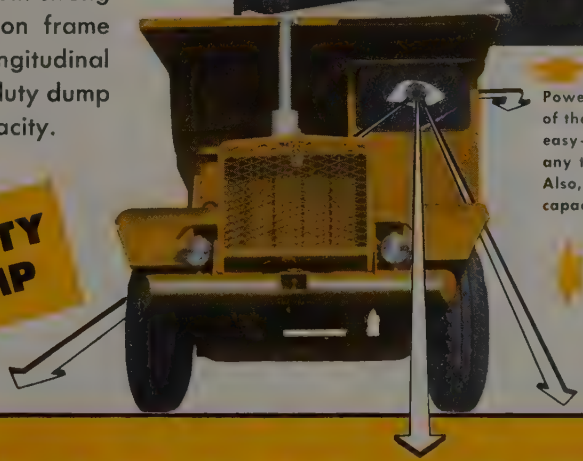
MANEUVERABILITY Tight turning radius, wide-axle track and power steering assure Kenworth 801 owners easier handling, greater safety, less driver fatigue.

CAPACITY Pay load is 36,000 lbs. Body capacity struck measure is 12 cu. yds. Heaped load is 14 yds. (3 to 1).

DEPENDABILITY The Kenworth 801 is built strong where the strain comes, with variable section frame and all-welded steel body braced with longitudinal reinforcements. Spring mounted, this heavy-duty dump truck is engineered throughout for over capacity.



Power steering means con
of the Kenworth 801 is sure
easy—loaded or unloaded—
any terrain. Ends road sh
Also, note rugged 25,000-po
capacity front axle—really



Unique chassis design
the Kenworth 801 gi
driver unequalled vis
fore and aft, and on b
sides. Safer to oper

801 HEAVY-DUTY END-DUMP

KENWORTH

TRUCKS ★ BUSES

Richardson of Miles City for 21.6 mi. of surfacing on the Hulett-Aladdin road in Crook County. **Knisely-Moore Co.** of Douglas submitted low bids of $107,012 for 16.2 mi. of surfacing on the Bates Creek-Medicine Bow road in Natrona County, $237,102 for 8.8 mi. of grading and surfacing the Lusk-Van Tassel road, $172,978 for 4.7 mi. of grading and surfacing on the Osage-Newcastle road, and $262,665 for 9.7 mi. of the Casper-Natrona road and 4.7 mi. of Natrona County road, grading and surfacing.

Riedesel-Lowe Co. of Cheyenne submitted a low bid of $229,405 for construction of a bridge over the North Platte River in Natrona County. **Gilpatrick Construction Co.** of Riverton submitted a low bid of $138,405 for 13.4 mi. of grading and surfacing the Riverton-Sand Draw road in Fremont County.

ALASKA

RECENT MAJOR CONTRACT AWARDS and low bids in Alaska include a low bid of $362,500 submitted by **Doughty Construction Co.** of Anchorage for construction of the Municipal Auditorium in Anchorage. **Grove, Shepherd, Wilson & Kruge, Inc.** of Seattle received a $4,196,083 award for construction of eight 3-story dormitories and three mess-administration buildings at Ladd A.F.B. near Fairbanks. **Kincaid & King Construction Co., Inc.** of Anchorage and **Anchorage Builders, Inc.** submitted a low bid of $740,991 for construction of the Arctic Aeromedical Laboratory at Ladd A.F.B. near Fairbanks. **Lytle & Green** and **S. Birch & Sons** of Seattle submitted a low bid of $1,279,096 for paving the 63-mi. section of the Glenn highway between Big Timber and Porcupine. **Pacific-Alaska Contractors, Inc.** of Tacoma submitted a low bid of $358,129 for construction of outside utilities at the Port of Whittier.

Here and There

ENGINEERS' CONSOLIDATION—Construction of the two most closely related dams on the Missouri River, Fort Randall and Gavins Point, will be carried out under one Corps of Engineers' area organization in the future, according to Col. Thomas J. Hayes, III, Omaha District Engineer. The new division, to be called the Fort Randall area, will be headed by George Evans, who has been supervising the building of Fort Randall Dam since its start in 1946. John Hayes, who took charge of the Gavins Point Project in 1952, will supervise the Nebraska-South Dakota project under the new area engineer. Charles Brown, Evans' assistant at Fort Randall, will continue in his present job. Gavins Point Dam is being built as a re-regulating dam downstream from Fort Randall. Both dams are scheduled for completion in 1956.

BAY BRIDGE APPROVAL—The Secretary of the Army has approved the state's application to build another bridge across San Francisco Bay from Third and Army streets in San Francisco to Bay Farm Island in Alameda County. Governor Goodwin J. Knight immediately asked Norman J. Raab, chief of the division of San Francisco Bay Toll Crossings, to direct engineering studies leading to the preparation of plans and specifications for the project. The sum of $1,500,000 is available for this job, estimated to take about 18 months.

Richard E. Dougherty, of the New York firm of Seeley, Stephenson, Value-Knecht, and Daniel V. Terrell, dean of the University of Kentucky college of engineering, will serve as engineering consultants on the project, which will cost between $250,000,000 and $300,000,000. The Army specified that construction must begin within five years.

SNOWY MOUNTAIN CONTRACT—A contract award for construction of a 26-ft.-diameter 14-mi.-long concrete-lined tunnel, a 100-ft.-high by 260-ft.-long diversion dam, and a 290-ft.-high by 715-ft.-long concrete arch dam on the Snowy Mountain Project in southeast Australia was finally let after months of discussion. It went to a joint venture of Henry J. Kaiser Co. (sponsor), Walsh Construction Co., B. Perini & Sons, Inc., Raymond Concrete Pile Co., General Construction Co., Bates & Rogers Construction Corp., and The Arthur A. Johnson Corp. for more than $56,000,000. Only about 35 Americans will be hired in key positions, an Australian spokesman said. The rest of the 2,000-man labor force will be Australian. The job is expected to take about seven years. Design was handled by U. S. Bureau of Reclamation engineers (*Western Construction*—April 1954, p. 102).

THE FEDERAL POWER COMMISSION has received a number of power development applications from various governmental units and public utilities. Included is a 7,000-kw. development on the American River by Placer County, a 30,000-kw. development on the Eel River by G. L. Carrico, a 120,000-kw. plant on the McKenzie River by the City of Eugene, Oregon, a 200,000-kw. development on the McCloud River by the California-Oregon Power Co. (in conflict with a 280,000-kw. application by Pacific Gas & Electric Co.), and two Pacific Power & Light Co. applications on the Lewis River totaling 85,000 kw.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

BALMY SPRING WEATHER in Western Alaska gives promise of an early construction season which will give jobs to thousands of Alaskans and a shot in the arm to the economy of Alaskan communities. Contractors and labor unions alike have expressed a belief that the construction season will get going far earlier this year than last. Some contractors said active hiring would begin as early as April 15. Others estimated their hiring schedules would begin to pick up after May 1, with the peak of hiring expected around late July and early August.

SOME GLOOMY ASPECTS of an otherwise bright employment picture: the opening of the construction season and the employment of thousands of Alaskans may be jeopardized by failure of construction craft unions to settle their differences with employers. Larry Moore, Alaska manager for the Associated General Contractors, points out that failure of construction crafts to reach an agreement with employers can have "serious effects on the Alaska economic picture." Moore said that unless electricians, plumbers, and carpenters come to some agreement soon, their failure to do so can very well affect adversely the employment situation of every construction craft in the territory.

JOB RUSH IS ON—A heavy influx of job-seekers into Alaska is reported by unions and employment officials in Anchorage. Almost unanimously, unions were seriously concerned with the job-rush, stating that there are now a sufficient number of workers in Alaska to fill available vacancies. Despite this, hundreds of workers are heading north at a time when hiring is at its lowest ebb. For example, Harold Groothuis, business representative for the laborers local in Anchorage, said his union now has several hundred Anchorage residents actively seeking work. Groothuis emphasizes that the jobs which open up will go first to Alaskans. More than 3,000 persons are now unemployed in the Anchorage area. The employment security office here has reported that poor information available to stateside job-seekers is contributing to the ranks of the unemployed.

FLOOD OF JOB MAIL—An avalanche of mail from anxious job-seekers in the states is pouring daily into the offices of unions, contractors, and employment services in Anchorage. One contractor states he gets about 50 letters a day, many from foreign countries, applying for Alaskan construction jobs. Because he has no staff, the letters must be dumped into the waste basket. Union offices, the Associated General Contractors, and employment agencies report a heavy volume of "job mail." The volume of mail is reported to be the heaviest in history, indicating increasing unemployment stateside.

CONSTRUCTION NOSEDIVE—Military construction expenditures in Alaska are expected to take a nosedive next year and diminish rapidly each year thereafter. Lt. Col. L. E. Foote, Alaska District Engineer, said that although construction expenditures this year are larger than last, the outlook for 1955 and 1956 is for decreased volume of new construction. This year, about $130,000,000 in military construction will be accomplished in Alaska. Next year, however, total work anticipated will be only about $75,000,000. A further drop in the volume of military construction in 1956 to somewhere in the order of $30,000,000 is forecast by Foote.

END OF AN ERA—Lt. Col. Foote, in a speech before the Alaska Chamber of Commerce, stated he felt that an era of exploitation in Alaska is about over and a period of "great development and substantial progress lies ahead." He added: "If there are any purveyors of gloom and dismay present, let me say that we in the Corps of Engineers do not agree. Alaska, more than any other area under the American flag today, can be properly considered a land of opportunity." Foote believes that the impact of diminishing construction volume might be eased by civil works projects. Requirements for labor, transportation, and services of all kinds will continue approximately at existing levels throughout this year.

CONTRACT SUMMARY—The Alaska district engineer is still busily taking bids and awarding contracts on additional work, although there is some speculation as to how long and to what extent this will continue. At the present time, the Engineers have on their books about 115 projects in various stages of planning. Estimated value of these is roughly $68,000,000. Average rate of construction in Alaska over the past three years was $129,000,000. At the present time, there are 105 active construction contracts in effect with 48 different construction firms handling the work. The contracts range in value downward from the over $29,000,000 contract with the firm of Williams Brothers-Marwell - McLaughlin for construction of the Haines-Fairbanks pipeline. A review of the dollar volume of military construction during the past few years shows that in 1950, $35,000,000 was spent; in 1951, $137,000,000; in 1952, $133,000,000; and in 1953, $117,000,000. This year the construction total will rise again to $130,000,000.

MILITARY CITY—Plans for construction of a $4,196,082 "military city" at Ladd Air Force Base moved ahead with the announcement that the contract for the job has been awarded to the Seattle firm of Grove-Shepherd-Wilson & Kruge, Inc. The huge military housing and administration project calls for construction of eight three-story airmen's dormitories, a one-story mess hall, and a large administration building.

WILDERNESS SKYSCRAPER—A project that is one of Alaska's most unusual—the construction of a 14-story skyscraper in an uninhabited wilderness of glaciers, virgin forests, and "wide open spaces" is scheduled to be opened for bid this month. The skyscraper will be built at the Army's port of Whittier. It will provide housing facilities to the extent of 177 apartments and 39 civilian bachelor quarters. Limited space at the Army port is one of the circumstances which prompted the "vertical" type of construction for the area. Only about 100 acres of level land are available at Whittier. The apartment building will be Whittier's second largest. Last year, another huge skyscraper building was turned over to the Whittier Port Command, providing housing accommodations for 1,200 officers and enlisted men. The latter structure, generally regarded as the largest and most complete military housing structure erected by the Engineers, has been titled the "City Under One Roof."

FUNDS FOR HIGHWAY construction in the Territory were given a sharp slash in Washington when the House Appropriations Committee voted $7,000,000 for work on Alaska's roads during the fiscal year of 1955. This was $2,950,000 less than the President had asked. The sum of $700,000 from that total was earmarked by the Committee specifically for work on the Copper River Highway. Meanwhile, A. F. Ghiglione, Alaska Road Commissioner, said that plans were being prepared for a May 1 bid call for more than a mile of bridge on the same highway, based on the expectation that the $700,000 appropriation would be forthcoming. The sum of $2,400,000 was appropriated during fiscal year 1954 for construction on this highway.

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ALL-NYLON STRENGTH

The Con-Trak-Tor's Nylon cord body withstands murderous impact . . . means that you get every hour of tire life built into this great U. S. Royal tire.

TRIPLE IMPACT PROTECTION

The Con-Trak-Tor's built with extra rubber between cord-plies—double shock-pads beneath the tread—tough rock-resisting construction at the crown.

FULL LUG TRACTION

The Con-Trak-Tor's full-width lug design digs deeper, pulls harder in forward or reverse—actually works where other tires stall.

Prove it. Put the Nylon U. S. Royal Con-Trak-Tor to work—watch your pay loads stay on the move. Your U. S. Royal Dealer has it in your size, for your job.

NYLON...Keeps Pay Loads Moving!

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ENGINEERS on the move

With the authorization by the 1953 Oregon state legislature of $35,000,000 in bonds in addition to the regular highway revenues and federal aid funds, the responsibilities of **R. H. Baldock,** State Highway Engineer, in carrying out a five-year program of renewal and reconstruction, have greatly increased. As a consequence, **W. C. Williams** has been named deputy state highway engineer, newly created number two position for the entire highway department. As principal aide to the chief engineer, he is responsible for the administrative and technical details of getting things done. Moving up to assistant highway engineer is **G. S. Paxson,** who continues to have general responsibility for all location, design, and construction of bridges, and in addition is responsible for and coordinates all technical research for the department. The materials division also is under his supervision.

The entire field bridge construction program is headed by **P. M. Stephenson,** and recently promoted to assist him is **J. T. Skelton,** formerly resident bridge engineer in Portland. **W. W. (Bill)) Stiffler** continues as assistant engineer in charge of operational features of the highway system. Changes among other engineers include the promotion of **Gerald W. Wimer** to the position of district maintenance superintendent at Coquille. He had been division office designer in Roseburg. Also, **Mitchell M. Stump,** resident engineer in The Dalles, is now district maintenance superintendent at Baker.

* * *

Walter L. Huber, San Francisco consulting engineer and past president of the American Society of Civil Engineers, has been selected by President Eisenhower to be presidential adviser for the Arkansas, White and Red River Basins Survey. This is an assignment without precedent in federal water resources planning. Huber's duties will include assistance to the Interagency Committee in completing an integrated river basin report.

* * *

Charles E. Shevling has been appointed Skagit project engineer. A civil engineering graduate of the University of Washington, Shevling started to work for Seattle City Light in 1934 as a transfer from the City engineering department. He has worked in various capacities including assistant resident engineer on the Skagit Project from 1943 to 1947 and resident engineer since that time. Succeeding him as resident engineer is **Robert E. Brown,** who had been Shevling's assistant. **C. W. Cutler,** who had been Skagit project engineer, has returned to his private consulting practice.

* * *

Harry A. Winne, nationally known engineer who recently retired as vice president of General Electric Co., has been chosen as recipient of the National Society for Professional Engineers' 1954 Award. The honor is bestowed annually on an outstanding engineer in recognition of meritorious service to the engineering profession.

* * *

Lawrence E. Hall, as of March 1, joined the staff of the Washington State Power Commission, Seattle, as planning engineer. Formerly he was employed as civil engineer since 1947 with the Seattle District Corps of Engineers.

* * *

Lloyd E. Garst, formerly materials engineer in charge of the Bureau of Reclamation's Cachuma Project laboratory, has accepted a position with the United Water Conservation District as chief of laboratory for Santa Felicia Dam, construction of which is to start shortly in Ventura County, Calif. (*Western Construction* — Feb. 1954, p. 67.)

* * *

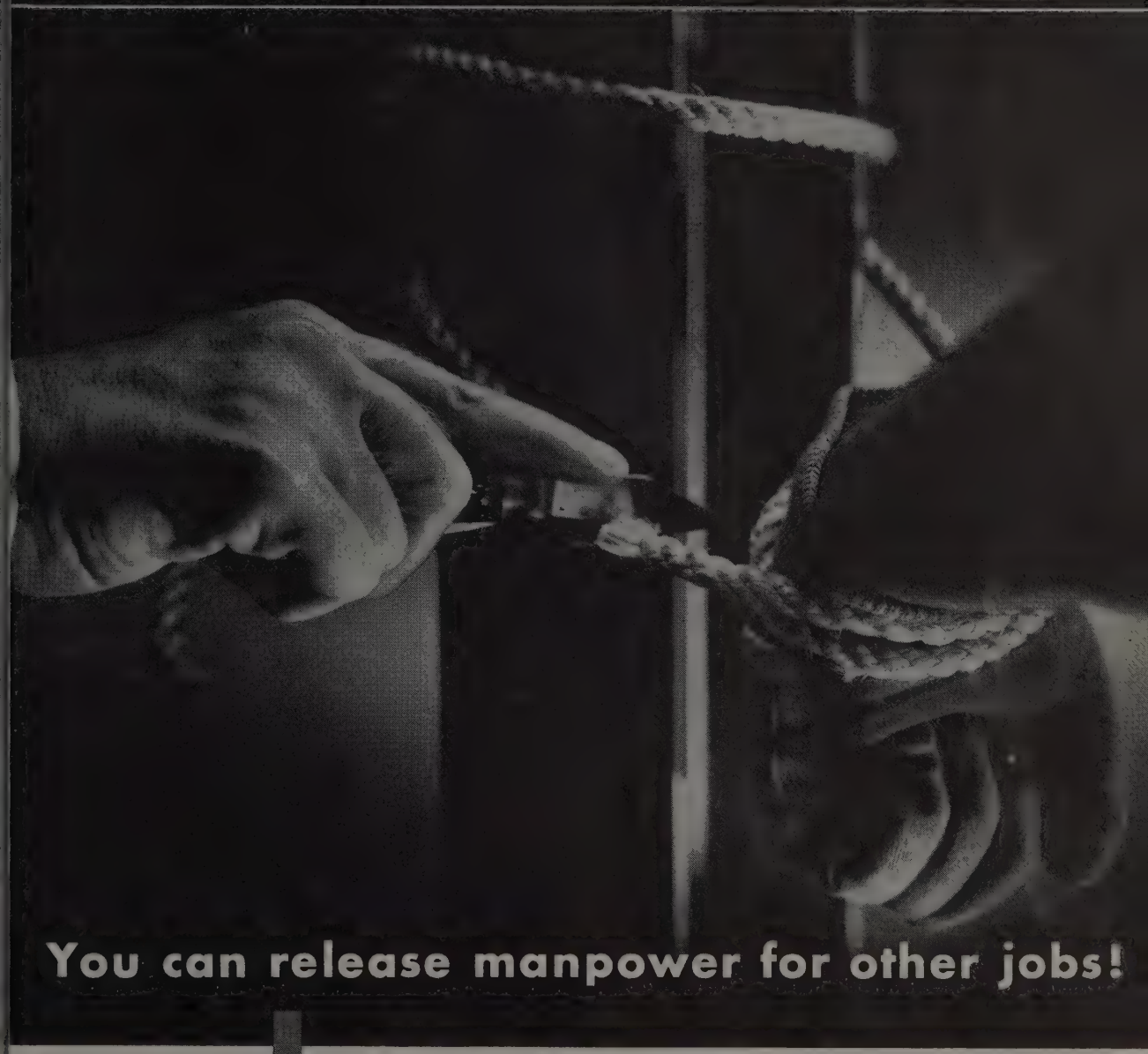
L. N. McClellan, chief engineer of the Bureau of Reclamation, Denver, Colo., made a visit to Australia as an adviser on the mammoth Snowy Mountains water diversion project. His trip is part of a cooperative agreement in which the Bureau is furnishing Australia with extensive technical training and counsel. The project is being built to divert water under a mountain divide from the coastal area to the interior and will furnish nearly 2,000,000 ac. ft. of irrigation water and provide about 300,000,000 kw. of power. Several Reclamation engineers are already in Australia in connection with the project.

* * *

John J. Gould, San Francisco consulting engineer, has been named chairman of a subcommittee to work for joint San Francisco-San Mateo County reclamation of tidelands. Serving with Gould on the 8-man

SAFETY AWARD WINNERS—Three members of the Southern California Chapter of the Associated General Contractors have won national honors among contracting firms for activities in the field of accident prevention. Left to right: *J. R. O'Neill,* saftey supervisor of Fluor Corp. Ltd., (third place for best 10-yr. record in heavy construction division); *Richard E. Arbogast,* president of Newbery Electrical Corp. (first place for best 10-yr. record in same classification); *Wm. E. Irish,* president of Southern California Chapter of AGC; *J. V. Quinn,* partner in firm of Quinn & Conant (certificate of commendation for 1953 record of no lost-time accident in 10,000- to 50,000-man-hr. exposure group in the building division) and *W. D. Shaw,* general manager of Southern California Chapter.

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE



You can release manpower for other jobs!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

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- LOWER TIME COSTS
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- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

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subcommittee are **N. M. Floyd,** manager of Stone & Webster Engineering Co., San Francisco and **R. B. Rothschild, Jr.** of Rothschild-Raffin & Weirick, general contractors, San Francisco.

* * *

George N. Carter has been named regional supervisor of irrigation for Region 1 of the Bureau of Reclamation, Boise, Idaho. He will supervise the Bureau's irrigation operation and maintenance in the Pacific Northwest. Since 1946 he has been project manager in charge of the central Snake projects office.

* * *

Henry F. Hannis, former U. S. Army engineer, has been reelected president and chairman of the board of the Middle Rio Grande Flood Control Association.

* * *

Frank L. Beadle, construction superintendent for Pacific Power & Light Co., Portland, Ore., was recently elevated to the position of executive assistant to the vice president and chief engineer. His new duties involve control of the construction budget, as well as the coordination of work in the general operations department. **Alex J. Homchick,** who was Beadle's assistant, is now acting construction superintendent in charge of the construction division.

* * *

George O. Matkin of Idaho Falls, was recently appointed city engineer of Anchorage, Alaska. He succeeds **R. W. Haselwood,** who resigned last October. Befor entering private practice in Idaho Falls in 1951, Matkin was city manager and engineer of Nephi, Utah.

* * *

Henry Cole, chief project engineer for Tacoma City Light, has been named superintendent of the light division, succeeding to the position left vacant when **J. Frank Ward** left to become managing director of the Washington State Power Commission. Cole has been associated with the light department since 1922.

* * *

C. A. Erdahl, acting director of the Department of Public Utilities of Tacoma, Wash., is not to be appointed to the directorship of the department, according to a recent announcement by the city's new Public Utility Board. Erdahl has served as head of utilities for more than ten years.

* * *

Ramon Schwegler of the Bureau of Public Roads, Portland, Ore., was recently installed as president of the Northwest Society of Highway Engineers. Other officers include: **Paul J. McKay,** Washington Highway Department, first vice president; **F. Bruce Crandall,** Oregon Highway Department, second vice president, **R. L. Porter,** Oregon Highway Department, third vice president; **D. J. Barbee,** Portland, treasurer; and **E. I. Roberts,** Washington Highway Department, secretary.

When the "top command" of the Bureau of Reclamation gets together, it represents 112 years of engineering experience in construction and operation of world-famous reclamation projects and 142 years of federal service. Reclamation Commissioner *W. A. Dexheimer* (seated) and (left to right) assistant commissioners *Stanley W. Crosthwait, Harvey F. McPhail,* and *Leslie N. McClellan.*

* * *

Fred B. McCoy received the unanimous confirmation of the city council and in mid-March was sworn in as Seattle's superintendent of buildings. **Arthur Dodds,** who has been acting superintendent since last August, returned to his civil service position as assistant superintendent of buildings.

* * *

Chester W. Beaver, plans and office engineer of the Wyoming State Highway Department since 1946, was recently honored for twenty-five years' service with the department. Beaver joined the department in 1928 on graduating in civil engineering from the University of Wyoming.

* * *

David E. Morris has resigned his post as public works director of Tacoma, Wash., to enter private business in Tacoma. **Elmer Bashey** has taken over his duties until a permanent director is named.

* * *

Brigadier General E. C. Itschner recently became Assistant Chief of Engineers for Civil Works, with headquarters in Washington, D. C. In that position he has responsibility for supervising the nationwide civil works program of the Corps of Engineers. General Itschner began his Army career upon graduation from the U. S. Military Academy in 1924. He served in World War II in various capacities and with the termination of hostilities in Europe, he was assigned as base commander in the Philippines. At the conclusion of the war, he served three years as chief of the miiltary construction operations division in the Office of the Chief of Engineers. From 1949 to 1950, he was district engineer at Seattle, Wash. Then he went to Korea and later, in April 1952, he was assigned as North Pacific Division Engineer, with headquarters in Portland, Ore.

* * *

W. H. Baugh is resident engineer for the Bureau of Public Roads on a 4.1 mi. access road extending to Travis AFB from Highway 40 in California, a $848,757 project under contract to Parish Bros. and Harms Bros. Another BPR man working in California is **J. O. Taylor,** who is resident engineer on a $76,510 access road job extending from Amboy to the Marine Training Base near 29 Palms. Wells Cargo, Inc. is the contractor.

* * *

G. E. Nelson, resident engineer for the Bureau of Public Roads, is located on a highway project in Arizona, which consists of grading, drainage structures and bituminous preservative treatment of 4.8 mi. on the south approach to Grand Canyon National Park, including some work within the park boundary. Givens Construction Co. is doing the work at a cost of $240,000. On another grading and drainage job, nearing completion in Arizona, **F. T. Burgess** is resident engineer for the BPR. Project involves 5 mi. of road, and

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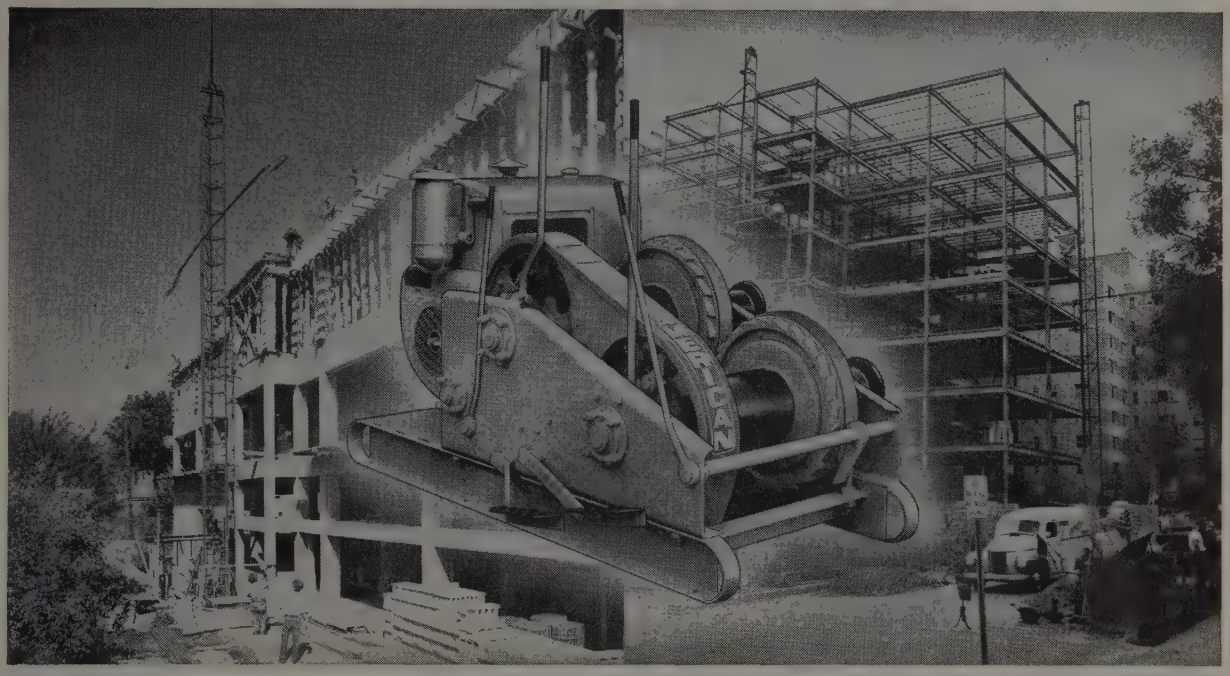

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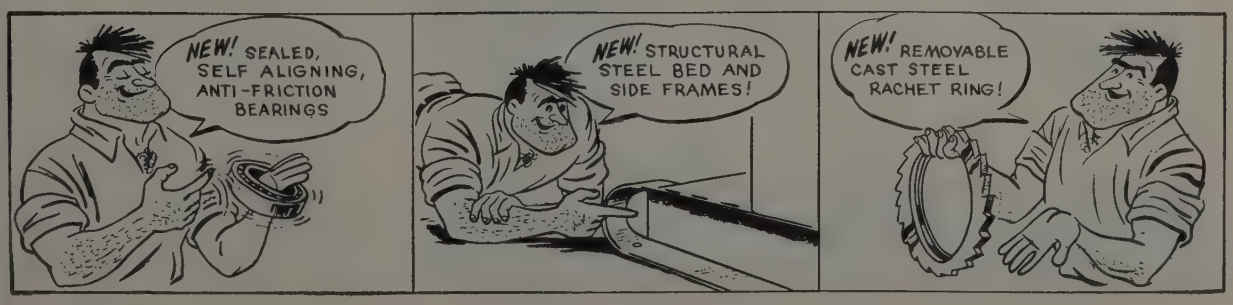

is under contract to Goodman Construction Co. A further BPR project nearing completion is 3.6 mi. of grading, drainage structures, etc. within the Salt River Indian Reservation, contract for which is held by Wallace & Wallace. **W. Pendergrass** is project engineer for the Bureau.

* * *

J. R. Lewis has been recently assigned to the Hawaii District office of the Bureau of Public Roads as the district highway bridge engineer.

* * *

William T. Wright of Kistner, Wright, and Wright is the newly elected president of the Structural Engineers Association of Southern California, succeeding **Ben Benioff**. Elected to serve with him as vice president is **Henry M. Layne. C. M. Corbit, Jr.** is secretary-treasurer of the association, serving his third term.

* * *

Ford J. Twaits, Los Angeles contractor for 42 years and chief executive of Ford J. Twaits Co., was recently presented with the Construction Industries Sixth Annual Achievement Award, sponsored by the Construction Industries Committee of

Ford J. Twaits **Achievement Award winner**

the Los Angeles Chamber of Commerce. The award is presented annually to a member of the industry on the basis of lifetime achievements in public service, service to the construction industries, public relations, and in the science of design, construction, and materials. Twaits is founder and twice president of the Southern California Chapter of Associated General Contractors and is a member of Consulting Constructors' Council of America.

* * *

Donald E. Heym of the hydroelectric design branch of the North Pacific Division office of the Corps of Engineers was recently transferred to the Portland District as project engineer of Lookout Point Dam, in permanent charge of operations and maintenance. Lookout Point spillway is scheduled for completion in July and construction of the powerhouse is more than half completed.

* * *

Robert E. Hickson, chief, operations division of the North Pacific Division, Corps of Engineers, retired the end of April after more than 46 years of continuous service in the Portland area.

DEATHS

Rudolph W. Van Norden, 79, a consulting engineer who played a major role in the electrification of the West, died in San Francisco March 8. During his career he designed and supervised construction of many power plants and transmission systems, as well as fifty high dams and was technical adviser to the secretary of the interior on Hoover Dam in 1929-30.

* * *

Thomas L. Wakefield, 30, a civil engineer with the Bureau of Reclamation and a lifetime resident of Boise, Idaho, died March 3 in a Boise hospital.

* * *

John W. Brennan, 64, contractor of Pocatello, Idaho, died there March 11 after a long illness. He was a past state president of AGC and served as a national director for three years.

* * *

Lloyd M. Root, an employee of the Nevada Department of Highways for the past ten years, died at his Reno home March 16 after a lengthy illness.

* * *

Theodore P. Flynn, 53, died in Portland, Ore., March 9. He had been with the Forest Service for 23 years and was the inventor of many devices now used by the Service.

* * *

George E. Tonney, 72, civil engineer and former San Francisco city engineer, died at his home in Los Angeles on March 12.

* * *

Ralph O. Dixson, contractor of Santa Margarita and San Carlos, Calif., died of a self-inflicted bullet wound at his San Carlos office on March 26.

* * *

Lawrence Petersen, veteran civil engineer with the Cody, Wyo., office of the Bureau of Reclamation, died of a heart attack March 22.

* * *

Guy A. Coburn, 67, retired contractor, died March 24 in Albuquerque, New Mex.

* * *

Benjamin J. Friedrichs, 76, retired state highway employee, died in a Weaverville, Calif., hospital early in March.

* * *

William A. Knight, 78, an employee of the Salt Lake City engineering department for 52 years, died of a heart ailment March 2 while on vacation at Mesa, Ariz. Knight was considered an authority on Western water problems.

SUPERVISING the jobs

T. R. Wilcox, general superintendent, **R. K. (Dick) Griffith,** job superintendent, and **Ray Mather,** office manager, head the personnel working on the $1,075,507 contract of Engineering Constructors, Inc., which is doing the plate-steel pipe work on the Camino conduit, a part of the Central Valley Project, Calif.

John E. Mallard is job superintendent for Strain & Brown, Inc., contractor on the temporary repairs to the north-south runway at Clovis A.F.B., New Mex., a $150,000 job. **J. L. Brown** is foreman.

A. T. Murphy is A. Teichert & Son's superintendent working on Project 2, Lomita Blvd. storm drain, in Torrance, Calif. Others working on this $550,000 project are **M. E. Noble,** assistant superintendent; **Roy Thomas,** master mechanic, and **Ruth Wyndham,** timekeeper.

Ivar Eidem, superintendent, and **James E. Arntson,** engineer, are top men on the erection of headquarters shop building in Seattle for the Washington Department of Highways. Noble W. White is the contractor who won the award on a bid of $330,301.

Lee Clements is superintending the construction of a 563-ft. bridge over the Willamette River, a $150,000 contract recently awarded to Tom Lillebo by the Oregon State Highway Department.

W. H. Shields is directing the overall construction of a dormitory addition at the University of Oregon, Eugene, contract for which was recently awarded his company on a low bid of $818,654. **Ralph Gibbs** is job superintendent, and **John W. Northway** is working as carpenter foreman. Building is of reinforced concrete with brick veneer, and is expected to be completed early in 1955.

Francis M. Libershal, project manager, and **William W. Maxwell,** superintendent, are directing a highway job in Los Angeles County, Calif., for Robert E. L. Parker Co. A $284,000 contract, work consists of 1.6 mi. of additional lanes to be graded and surfaced. **Joe Soto** is labor foreman.

C. R. Tumblin, as superintendent, heads the Tumblin Company contract for the erection of a stadium and site improvement for the school district in Bakersfield, Calif. Working as foreman on this $1,161,000 project is **Joe Galvin.**

Peter Chesler, superintendent; **George Hanson,** master mechanic, and **Del Thompson,** office manager, head the construction force working at the Folsom reservoir project, drilling and grouting foundation through embankment. Contract for this work amounts to $295,000 and is held by Selby Drilling Corp.

G. L. Compton, partner in the firm of J. C. Compton Co., is acting as superintendent on his company's $540,000 contract for grading 12.2 mi. and paving 13.3 mi. of a section of the Central Oregon Highway near Burns. Other important personnel are **Carl Daniels,** paving superintendent; **Paris Chase,** plant foreman; and **L. Gunter,** street foreman. J. M. Arenz is doing the grading, with **Jack Harrington** in the superintendent spot.

Fred Ross is general superintendent for Riedesel Construction Co., which is erecting the $1,500,000 high school at Helena, Mont.

Working under the general direction of **J. B. Parson,** whose company won the $440,000 award, the following personnel are key men on the grading and paving of 21 mi. of highway near Malta, Idaho: **L. B. Adams,** grade superintendent; **Paul Garner,** oil superintendent; **LaMar Jones,** pipe foreman, and **Ronald Hadfield,** foreman of gravel operation.

Bill Harrison, job superintendent, and **John Ryan,** general superintendent, are directing the work of the Arizona Sand & Rock Co., which has a $518,000 contract for 9.6 mi. of widening the existing roadway beginning 50 mi. northeast of Globe, Ariz., on U. S. 60.

R. L. Fuller, superintendent, is directing the work of the Quiller Construction Co., Inc., which has a $561,132 contract for propellant facilities at the jet propulsion laboratory, Pasadena, Calif. **F. Miller** is project engineer. **Miss B. J. Daugherty** is purchasing agent.

E. R. Peterson, project superintendent; **C. E. Morris,** field superintendent, and **J. C. Beck,** office man-

THE PAUSE THAT REFRESHES—Although there aren't any Coke bottles in this scene, *Willard Smith* (left), operator, and *W. E. Ross*, Shasta County (California) road foreman, pause in their snow-clearing labors for a break.

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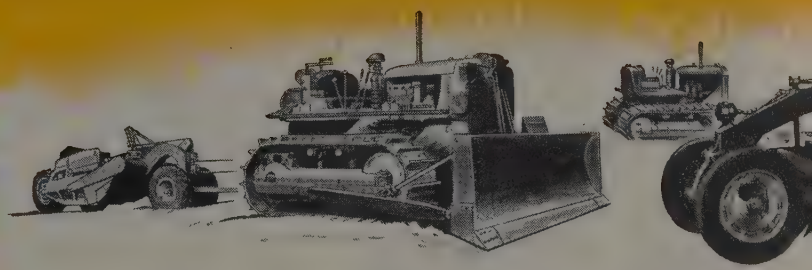

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BEST BUYS IN NEW AND USED EQUIPMENT

HEADING UP the work for Kiewit and Coker at Tecolote Tunnel *(Western Construction*—April 1954, pp. 49-51) is *Ray Blasongame* (right) superintendent. Blasongame, who holed through Alaska's Eklutna Tunnel last fall, has brought key men to the new job, among them being *Frank Weibel* (left) master mechanic. Others on the job are *A. M. Coker*, project manager; *Charles (Greaseball) Conrad*, assistant superintendent; *Don MacGregor*, project engineer; *Henry Franey*, safety engineer; *Ole Kubsch*, chief electrician; and *Jake Omann*, office manager.

ager, comprise the top personnel of Utah-Kitchell-Phillips, a joint venture which was recently awarded a $2,727,160 contract by the U. S. Air Force for facility buildings at Phoenix, Ariz. Known as Production Test Facilities, AiResearch Mfg. Co., Skyharbor Airport, job is expected to take about a year for completion.

* * *

Roy Bland, superintendent, is directing the work of building a school at Pico, Calif., for Kemp Brothers, contractor doing the $690,000 job. Purchasing agent is **Cecil Guy.**

* * *

James P. Purvis is in charge of over-all construction of a 4-story hospital addition to the Deaconess Hospital, Spokane, Wash., for the Purvis Construction Co., a $936,270 contract. **Walt Oman** is general superintendent on the work and **R. L. Dirks** is in charge of details.

* * *

Rogers Picket, general superintendent; **Dick Simmons,** dirt foreman, and **Ross Martin,** general mechanic, are top men working for Robert E. L. Parker Co., which has a $200,000 job for 4.7 mi. of grading and road-mix surfacing on Route 145-C, San Bernardino County, Calif.

* * *

Boyd L. Christensen, project manager; **Ralph Lloyd,** general superintendent, with **Evan Hendricks,** office manager; **Harry Bullock,** project engineer, and **Gene Beard,** office engineer, are the top men working for Morrison-Knudsen Co., Inc., and J. A. Terteling & Sons, Inc., doing apron extension construction at Mountain Home AFB, Idaho. This is a $616,341 job and covers work which is an extension of the joint venture firm's existing contract at the base.

* * *

Fred Stokes, under the general direction of **W. E. McKnight,** president and general manager of W. E. McKnight Construction Co., is superintending this contractor's $134,057 job involving site improvements, grading, curbs, gutters and roads for the Prudential Insurance Co. in Southern California Co. Other important men on the work are **E. R. McKnight,** concrete foreman; **Glenn Moore,** paving foreman; **Bill McGrath,** excavation foreman, and **Norman Nelson,** office manager.

* * *

John V. Leone is superintendent for Domenic Leone Construction Co. which recently received a $176,000 contract from the State for 9 mi. of construction on St. 71, Lincoln Co., Colo. **Joe Bubnic** and **Harold P. Hargrove** are foremen on the job.

* * *

R. G. Chandos is job superintendent for Gardner & McCall on the installation of storm drainage and flood control facilities for the Navy at Port Hueneme, Calif., a $233,700 contract.

* * *

M. B. Dorfman, general superintendent, is directing the 28-mi. sewer service line at Midway City, Calif., for Charles J. Dorfman, contractor on the $899,440 project. He has the assistance of four foremen, **Leo Dietrich,** Schedule A; **Don Baum,** Schedule B; **Roy Baum,** Schedule C, and **Felipe Quinones,** Schedule C.

* * *

Royd Lund, general superintendent; **Jack Hunter,** plant superintendent; and **G. F. Chinnici,** supervisor, are United Concrete Pipe Corp. top personnel installing 23 mi. of laterals, 5 mi. of concrete pipelines and pumping units, Area P-4, Columbia Basin Project, Wash. The USBR recently awarded the contract to United on a bid of $1,063,158.

* * *

C. W. (Bud) Carter is project superintendent for D. W. Falls Construction Co., which has the $280,500 contract for earthwork and structures for rehabilitation of laterals and drains, Vermejo Project, New Mex. Other key personnel are **P. G. (Paul) Gibson,** concrete superintendent; **E. R. (Ernie) Hoffman,** project engineer; **L. B. Bysee,** general foreman; **C. Y. (Jenks) Jenkins,** master mechanic, and **Leon Childs,** equipment chief operator.

* * *

R. J. O'Meara and **C. R. Denton** are the two superintendents chosen to direct the $523,800 contract recently awarded Northwestern Engineering Co. for 13 mi. of grading, surfacing and oiling, Broadus-Wyoming line highway, Powder River and Carter counties, Mont.

* * *

Norman Moe, crushing foreman, and **James W. Jones** and **A. L. (Dutch) Willems,** dirt foremen, are among the top personnel working for Nilson-Smith Construction Co. on 11.7 mi. of grading and surfacing, Shelby-Chester highway, Toole County, Mont., a contract that recently went to Nilson-Smith on a bid of $318,119.

* * *

Cris Simovich, superintendent, and **G. F. Chinnici,** supervisor, are directing the work of the United Concrete Pipe Corp. on a $193,340 contract for storm drain construction, Wilcox Ave.-Park Ave., Montebello, Los Angeles County, Calif.

* * *

Lee A. Monson, superintendent; **Wendell Fife, Robert E. Lee** and **Steve Smith,** foremen; and **Fred Homer,** master mechanic, comprise the key men on the Fife Construction Co.'s $106,277 contract for 4 mi. of bituminous surfacing in Weber County, Utah.

* * *

Jack Burchett was project superintendent for J. H.-N. M. Monaghan Co. on the 14-mi. highway job on U. S. 6 near Derby, Colo., a brief description of which appeared in *Western Construction*—January 1954, p. 66.

Linn Hart was engineer representing the Colorado Highway Department, and not a Monaghan man as noted in the news item.

* * *

Al Berquist is superintendent on construction of the Blanchet High School, Seattle. He is assisted by **Joe Ness. A. Strand, E. A. Strand** and **Ray W. Strand** of Strand & Sons are acting as project managers on this $1,440,623 contract recently awarded to their company.

* * *

Dick Haggerty is superintendent for Lord & Bishop, contractor on the structural steel swing span bridge, grade approaches and surfacing at Miller's Ferry, on the Mokelumne River, Calif., a $300,000 job.

* * *

Lee T. Dulin is working for Louis Elterich Co. as engineer on a $152,545 contract for the construction of deck girder spans, concrete piers and abutments for Union Pacific R. R. bridge at 15 Mile Creek, Wash.

* * *

Elmer Nelson, project superintendent, and **Robert Hansen,** project engineer, are two top men on the construction of a 76-bed hospital at Great Falls, Mont. This is a $1,430,427 contract recently awarded to Hagstrom Construction Co.

* * *

John W. Vickrey, assisted by **John T. Murphy,** is superintending the work of grading and paving 6.6 mi. of highway between Paso Robles and San Miguel in California for Gordon H. Ball and San Ramon Valley Land Co., who won the award on a low bid of $982,966. Office manager is **E. W. TeWinkle.**

* * *

A. L. Roark, division superintendent, and **R. J. Jones,** project superintendent, head the construction forces of Morrison-Knudsen Co., Inc., on a $1,191,335 contract to grade and pave 6.4 mi. of roadway located 3 mi. east of Sparks, Nev.

* * *

C. M. Loser, job superintendent, with the assistance of foremen **Buck Willis** and **Guy Haney,** is directing 9 mi. of grading work, gravel surfacing, road-mix oil and draining in Teton County, Mont., for S. Birch & Sons, who secured the contract on a bid of $206,057. **Keg Dahl** is managing the office.

* * *

Larry Mahan, with the assistance of foreman **Bill Ille,** is superintending a $130,000 contract recently awarded S. Birch & Sons Construction Co. for 14.4 mi. of plant-mix surfacing on the Armington-Lewiston highway in Montana. On completion of this job, the same crew will handle another $160,480 job in Montana for

Birch, consisting of 18.9 mi. of plant-mix surfacing on the highway between Harlowton and Moore.

* * *

J. J. Morton is project manager for Guy F. Atkinson Co., Ostrander Construction Co. and J. A. Jones Construction Co. on the installation of embedded turbine parts, concrete work in powerhouse and construction of 230-kv. switch structure for Units 9 to 14, at McNary Dam, a $2,057,080 contract. On the same work, **E. M. Watson** is project engineer and **W. B. Rives,** assistant general superintendent. Morton is also project manager of Atkinson-Ostrander contracts at The Dalles Project.

* * *

James Briggs, superintendent; **Herman Rossi,** foreman, and **W. F. (Dan) Boone,** engineer, compose the top personnel for John Delphia on his contract for construction of the San Rafael approach to the Richmond-San Rafael bridge in California. Delphia got the contract at a cost of $218,670.

* * *

N. E. Parson is general superintendent for Carl E. Nelson Construction Co., Inc., which was recently awarded a contract at a cost of $468,062 for 7.3 mi. of grading and plant-mix bituminous surfacing on Eden Highway from Twin Falls to Hansen bridge in Idaho. **Sam Gillette** is project superintendent, and **H. C. Christensen** is acting as timekeeper.

* * *

J. Brockway, general superintendent; **J. W. Cook,** construction manager; **Herb Jennings,** job superintendent, and **Amis Smith,** foreman, are key men on a $452,865 job recently awarded Stroud-Seabrook Construction Co. for unit 2, sewage collection main trunk line outfall sewer and pumping station in Bakersfield, Calif.

* * *

John Presley, as superintendent, heads up the sewage treatment plant and appurtenant work at Cayucos, San Luis Obispo County, Calif., for Main Construction Co., which is doing the work at a cost of $189,000.

* * *

Allen A. Kolher, project manager, and **Robert E. Badley,** general superintendent, with the help of concrete foreman **Joe Kubic,** are supervising for Stolte, Inc. on a $567,196 job recently awarded this contractor for earthwork, steel pipe lines and structures, laterals 23-30, Carpinteria pumping plant and Gobernador reservoir of the Carpinteria distribution system on the Cachuma Project near Goleta, Calif.

* * *

Robert C. Griffin is superintendent, **Paul E. Fox** is foreman, and **Raymond H. Sherwood** is office manager on a sewer contract recently awarded to Coast Pipeline Contractors on a bid of $180,110. Work consists of trunk lines, pumping station and appurtenant work at Cayucos and Morro Bay, San Luis Obispo County, Calif.

* * *

C. T. Anthony, general superintendent; **Dewey King,** field superintendent; **Edwin Lee,** project engineer, and **Ray Eagle,** construction manager, comprise the top personnel for Blackfield Construction Co., which is erecting 432 homes at Pacific Manor, San Mateo, Calif., at a cost of $4,000,000.

* * *

Henry Johnson is superintendent for Newland Construction Co. on a general contract for the erection of a 1- and 2-story 134x302-ft. office and storage building going up in Everett, Wash. Newland was awarded the contract on a bid of $472,419. **Walter Vandermeer** is labor superintendent.

* * *

Paul R. Opdyke, Jr., Herman S. Butler, and **J. D. Tucker,** partners in the Opdyke & Butler and Tucker Construction Co., are directing the building of 39 portable classrooms in Sacramento, Calif., a $254,783 con-

tract awarded the company by the City Unified School District.

* * *

E. F. Matelich, project manager; **Earl C. Gregg,** general superintendent, and **G. J. Patterson,** job superintendent, head the construction force of Morrison-Knudsen Co., Inc., which has the $735,000 conract for the Anaconda Senior High School going up in Anaconda, Mont.

* * *

Harold De Witt, superintendent, and his assistant, **W. A. Powers,** are directing the work on a high school project at Sacramento, Calif., for Darrigo & Powers, contractor who recently won the construction award on a bid of $1,088,490.

* * *

Mario Pucetti is superintendent for Theo. G. Meyer & Sons who received a contract from the city of San Francisco for a municipal housing project costing $5,302,175. **Ed Potts** is detailer for the work.

* * *

Louis Dorfman, superintendent; **A. C. Herriman,** foreman, and **E. N. Webber,** equipment superintendent, are key men for Charles J. Dorfman, contractor who recently got the contract for installing sanitary sewers in District 76, Manhattan Beach, Calif., on a bid of $673,665.

* * *

Paul Cross, superintendent, with the assistance of **Earl Shannon,** is directing the work of Henry Thygesen & Co., who is doing a $309,034 job in Lea County, New Mex., consisting of 21 mi. of rolling and asphalt surfacing on State 18.

* * *

Lee T. Dulin is superintendent for Louis Elterich Co., contractor building a railroad bridge at 15-Mile Creek at The Dalles damsite for the Corps of Engineers, a $152,545 award.

* * *

G. L. Smith is construction superintendent; **O. L. Roscoe,** engineer; and **G. Davis,** carpenter foreman, working for J. C. Boespflug Construction Co. which received the award from Kaiser Gypsum Co., Inc., for a gypsum board plant and plaster mill at Seattle, Wash. Cost of the project is $1,709,760.

* * *

Frank Kath is superintendent for Otto B. Ashbach & Sons, Inc., who received a $404,560 contract for reinforced concrete paving at Walker AFB, Roswell, New Mex.

* * *

John V. Leone is supervising a highway job in El Paso County, Colo., for Domenic Leone Construction Co. This is a $519,070 contract and work consists of 4.1 mi. of grading and concrete paving on U. S. 85-87 between

Monument and Colorado Springs. Other key personnel are **Joe Bubnic, William Gerres** and **Harold P. Hargrove,** all foremen. **Barbara Bunic** is handling the office details.

* * *

Carl Aos is supervising the erection of an overcrossing on P.S.H. 1, Snohomish County, Wash., contract for which is held by F. L. Dooley Construction Co., who got the award on a bid of $135,828. Other key men are **Frank Dooley,** concrete work; **Set Pivetta,** hoisting engineer; **Ed Peyser,** general maintenance, and **Fred Dooley,** who is in charge of the business end of the job.

* * *

Paul Spletzer is superintendent for Erwen Construction Co., which has a $293,254 contract on the Kennewick Division of the Yakima Project, Wash., for siphon crossings on Chandler Canal. Spletzer has the assistance of **Earl Farmer** and **Larry Linton,** carpenter foreman, and **Cliff Jones,** steel foreman.

* * *

Robert K. Boyd, project manager; his assistant, **J. A. Fillebrown;** excavation superintendent **E. G. Gressot,** and carpenter and concrete superintendent **W. M. McGinnis,** head the construction force of Guy F. Atkinson Co., which has the $3,400,000 contract for 6.3 mi. of 4-lane freeway with three concrete overpasses and storm drain facilities through the cities of Pomona and Claremont in Los Angeles County, Calif. Other key men are: **Dominic Billi,** master mechanic, and **John Billi,** his assistant; **A. E. Arnosti,** job engineer; **E. C. Herrick,** field engineer; **M. D. Smith,** grade foreman; **G. T. McCoy** and **D. J. Rossiter,** carpenter foreman; **L. W. Kennedy,** labor foreman. **W. D. Golston** is job office manager, and **M. S. Caffee** is timekeeper.

* * *

Jack Kasler is acting as project manager for Fredericksen & Kasler —Mojave Corp. on a $778,972 contract at Edwards AFB in connection with backfill mud mines. **M. H. Sandlin** is general superintendent. **"Slim" Ransdall** is equipment superintendent. Office manager is **M. H. Whalen.**

* * *

Don Huey is project manager and **Jim Jones** is superintendent on the erection of a municipal coliseum going up in Spokane, Wash. **Roger McConnell** is working as carpenter foreman on the same construction, a $1,700,000 job.

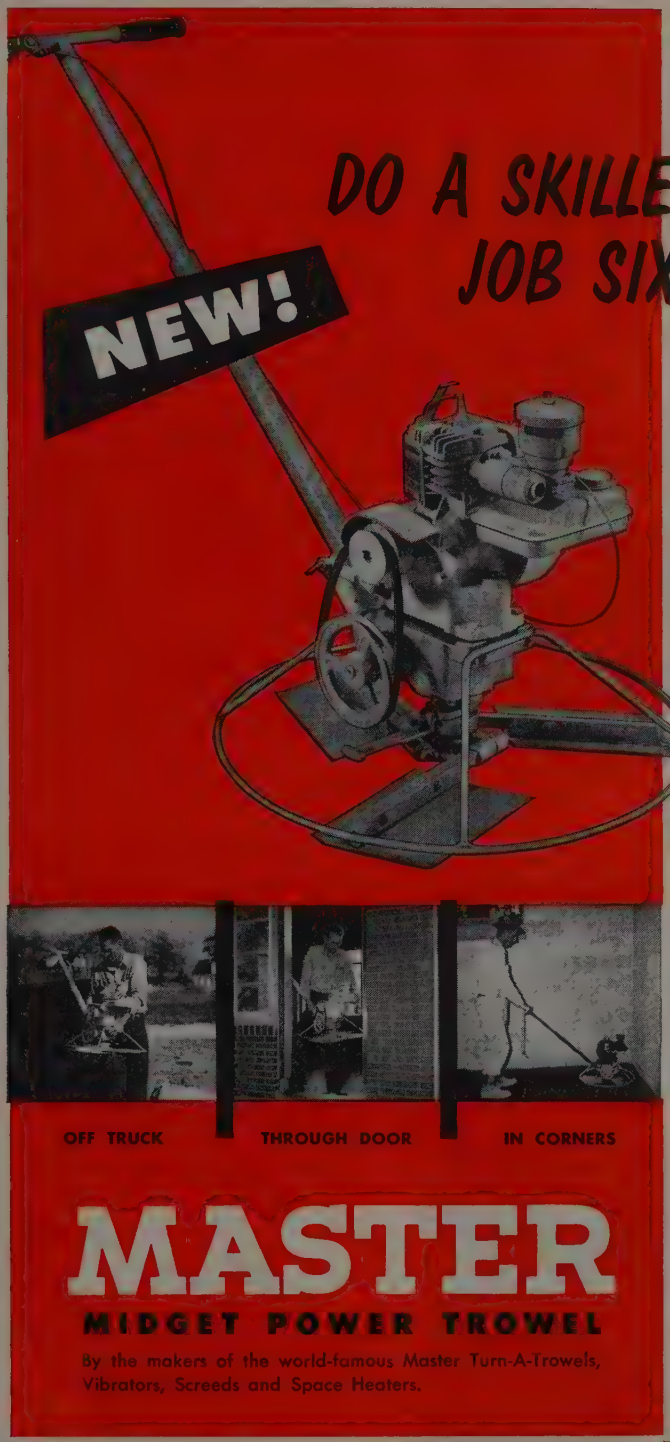
* * *

D. Gerald Bing is project manager for the joint venture firm of Westbrook and Morrison-Knudsen-Twaits which is building taxiways, runways and aprons for the USED at Edwards AFB, Calif., a $6,700,000 contract. Other key personnel for the prime contractor are: **W. R. Southworth,** concrete superintendent; **C. R. Bassett,** plant superintendent; **F. D. Moore,** header foreman; **Frank Scully,** field engineer; **Ken Ward,** office engineer, and **H. G. LaGrange,** office manager.

H. Earl Parker, Inc., has a subcontract for excavating and grading, on which **L. W. Brown** is working as superintendent, assisted by **Sid Murray. George Williams** is grade foreman and **William B. LaTorre** is master mechanic. **Jay Stiles** is plant superintendent for Glendale Ready-Mix Concrete, another subcontractor.

* * *

James Reimers is project manager and **Rex Mayfield** is assisting him in supervising the Bechtel Corp. contract to construct the El Segundo steam plant for Southern California Edison Co., a $50,000,000 installation. **George Brem** is structural engineer. **Jim Matheson** is carpenter superintendent. General foremen working at the site are: **Earl Miller,** structural steel; **Ralph Johnson,** reinforced steel; **Horace Johnson,** millwright; **Bob Locke,** pipefitter; **Mike Saunders, E. L. Richmond** and **John Cullen,** carpenter; **Bill Dowling,** elec-



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trical, and **Frank Nugent**, general labor foreman. **Joe Myers** is mechanical foreman; **Howard Burns**, carpenter; and **William Loudon**, electrical. Equipment superintendent is **Charles W. Hunt. A. H. Griffin** is field engineer. **Charles W. Hunt** is equipment superintendent. **William Lewis** is in charge of the office and **John Thomas** is doing the purchasing.

On a $3,000,000 contract held by Macco Corp. for outfall conduit for cooling water, the following men are among the top construction personnel: **Don Shupp**, job superintendent, assisted by **V. D. Casey**; and the following foremen, **"Slim" Hall** and **Ted Smith**, shift; **Charley Leedy, Jack Hendricks** and **Rollie Miller**, skid-rig; **Bud Ferris, Dee Rucker** and **Marvin Greene**, sheet pile; **"Doc" Blum, John Mulherron, Pete Bassette** and **"Chuck" Higginson**, framing. **Ray Jones** holds the master mechanic spot. Job engineer is **Jack Christiansen**, and office manager is **Jack Philippe. Harry Leasure** is resident engineer for Southern California Edison Co.

* * *

Don Munn and **Bob Perkins** of the contracting firm of Munn-Perkins & McCollum have the following personnel working as foremen on a $500,000 contract for grading and paving a stretch of highway southwest of Palmdale, Calif.: **T. O. (Tom) Croft**, general; **C. C. Hector**, crusher, and **Mel Croft**, hot plant.

* * *

Harold E. Weaver is superintendent and **William Browne** is his assistant on a $4,000,000 high school plant at Reseda, Calif., being built by James I. Barnes Construction Co. for the Los Angeles County School Board. **Bill Thompson** is general labor foreman. **Williard Flinders** is chief clerk and purchasing agent.

* * *

J. W. Schwab is superintendent for George A. Fuller Co. which is erecting an engineering flight test building for North American Aviation, Inc., at Palmdale, Calif. **Emil Hansen** is field superintendent and **A. R. Caskey** is carpenter foreman. Mehring & Hansen Co. is subcontractor on plumbing, heating and ventilation. **John W. Burton** is superintending this job. **Ed A. Stastny** is steamfitter foreman; **"Red" Lawson**, plumber foreman, and **George Bokkie**, air conditioner foreman.

* * *

William H. Frank is superintending the construction of vehicle maintenance facilities for Price-McNemar Construction Co., which received the award from the Corps of Engineers at a cost of about $600,000. **Vince Charbonneau** is carpenter foreman, and **John J. Stokes** is lay-out engineer on this structural steel and tilt-up construction job.

* * *

In addition to men already reported working with project manager **Peter Vanden Haak** on the Early-Stolte job at Palmdale, Calif. for Lockheed Aircraft Corp., the following are in key positions: **V. N. Chandler** is superintending the over-all construction of the industrial site. He has the assistance of **Stan Kister**, project engineer; and superintendents **J. Van Rooyen**, mill; **C. Crosby**, utility; **Dave Otis**, paving; **M. Jones**, concrete; **W. Drinkward**, carpenter; and **R. Edwards**, master mechanic; **T. Davis**, utility foreman; **C. Kyne**, carpenter foreman; and **G. Leonard**, labor foreman. **C. Vander Meide** is project detailer. **C. J. Haas** is in charge of the office work for the contractor.

On the runways and taxiways, **Bill Miller** is superintendent, with **Don Fix**, assisting. **B. Carroll** is project engineer. **J. R. Hernandez** is concrete foreman; and **Paul Hamby** is headerboard superintendent. On the earthmoving subcontract, **Lee Stephens** is key man. Two others in important spots on this work are **W. St. Jacques**, batch plant superintendent, and **Jack Sneed**, master mechanic.

* * *

P. L. Vail, construction manager; **John Starr**, project manager, and **Sam James**, superintendent, are in key positions on the construction of the South Reseda Junior High School at Reseda, Calif. for McDonald Brothers, who won the contract on a $1,885,890 bid. Project engineer on the job is **Allen Katz.** Other supervisory personnel include foremen **Wallace Nelson**, mill; **Ed Speary**, carpenter; **Benny Davies**, concrete; also **John Campbell**, engineer, and **Fred Romansic**, office manager. **Moses Mirazaki** is chief job inspector for Los Angeles City School Department.

* * *

Carrol T. Glenn is superintendent, assisted by **Joe Mabery**, on pier construction at Long Beach Harbor, a $1,200,000 contract of Guy F. Atkinson Co. for the city of Long Beach. Job engineer is **Art Morning.** Foremen are: piledriver, **Dick Carscallen**; framing, **W. H. Bates**; and concrete, **Hardy Clark. Charlie Atkinson** is office manager. **Tom Sawyer** is foreman for Soulé Steel Co., subcontractor.

* * *

Curt K. Whitney is superintending a $1,500,000 building erection job which Williams & Burrows, Inc., and Carl N. Swenson Co., Inc. are doing for the California Department of Public Health at Berkeley, Calif. **LaMarr Dees** is assistant superintendent. Foremen on the job are **Cullen Burke**, general; **Dan Manning**, cement finisher; **Chester Jaensen**, carpenter, and **Hiram McClure**, labor. **Don Grutzmacher** is engineer. C. E. Toland & Son has the miscellaneous steel subcontract, with **H. E. Rector** acting as steel foreman.

* * *

George T. McCoy, Jr., general superintendent for Guy F. Atkinson Co. on the big freeway job just north of San Francisco's Golden Gate Bridge (*Western Construction*—Feb. 1954, pp. 49-51) is being assisted by a long list of key men. **Albert G. Chaussee** is his chief assistant. **Milan C. Roych** is tunnel superintendent and **Eugene J.**

STATE HIGHWAY PERSONNEL, apparently happy about things, are (from left) *John Campbell*, *Don Bleak*, *Bob Hensley*, and *Lee Bunce*, resident engineer. The job is a four-laning project south of Santa Maria, California, on U. S. 101. See page 65 of this issue for further details.

Operator's Pride Key to Low Shovel Maintenance

by
R. G. THIBAUT
Service Manager, The Thew Shovel Co.

The pride of the operator in his job and his machine is the real key to low shovel-crane maintenance cost. If the operator takes enough pride in his machine and his job to see that proper lubrication and servicing is done on a regular schedule, costly shut-downs and repairs can be avoided.

All manufacturers want their machines to get the best of care — want them to serve the contractor well and safely throughout a long and trouble-free life. To that end they publish operator's manuals with preventive maintenance, adjustment and lubrication instructions and proper operation procedures. However, no one but the operator, or the master mechanic, can see that these programs are carried out completely.

Easy-access grease fittings and simplified adjustments are provided to make this part of the operator's job easier. Permanent lifting capacities mounted in the cab make it easy to keep loads within safe limits. But, the operator himself is still the key to the problem, because he is the only one that can implement the planning that is done to assure trouble-free operation. If he really knows his machine, and maintains and services it as the factory recommends, and does not abuse it, operating and maintenance costs will be reduced to a minimum.

It is a standing joke that women do not read instructions on new equipment they buy such as washing machines, cleaners, etc. Service engineers can testify that some operators apparently never read their service manuals either — or if they do, they don't remember what they read — or don't care.

It all comes back to how much pride the operator has — in his job, in his machine, and in himself. That is what really gets the most out of a piece of equipment — at lowest operating cost.

Dailey is excavation superintendent; **Edwin W. Schlue,** engineer; **Joseph E. Burnside,** master mechanic, and **Joseph C. Lawrence,** structures superintendent.

Foremen are **Alex D. Morgan, Charles H. Chamberlin, George Azevedo** and **Warren W. Blake,** excavation; **Charles A. Skelton** and **Eldred D. Cottrill,** general carpenter; **Mervyn B. Kennedy, William D. Seeley** and **Marvin E. Rupe,** labor; **Earl Hallidy,** greasing. **John Stone, William C. Janshen** and **Robert C. McLelland** are tunnel walkers.

Paymaster is **Joseph K. Scharf; Kelley B. Voorhees** is business manager; **Tom S. Owings** and **Kenneth E. Westfall** are timekeepers; **Maurice C. Hurt** and **Richard D. Jones** are storekeepers.

* * *

Elmer Cross, superintendent, assisted by **Bill Meuting,** is directing the work of McDonald, Young & Nelson on their $294,738 contract for construction of the 47th St. overpass and San Pablo Creek culvert at Richmond, Calif. **Ray Kidder** is labor foreman. Office manager is **Bob Russell,** and resident engineer is **W. A. (Bill) Chesney.**

* * *

Tony Moroni is superintendent and **Ed Viera** is assistant superintendent for Parker-Steffens & Pearce on the $1,500,000 cancer research laboratory going up at the University of California, Berkeley. **Elmer Johnson** is steel foreman and **Joe Soares** is labor foreman.

* * *

E. M. Daley is superintending a freeway fill contract in the San Francisco Bay area, at Candlestick Point, for Guy F. Atkinson Co., who is just about finishing up the job. **Blaine Thompson** is swing shift superintendent and **H. J. Lundberg** is master mechanic. Among the foremen are: Pit—**M. O. Crader,** day shift; **Dewey Costner,** swing. Fill—**Les Pettit,** day; **B. M. Moseley,** swing; Tire—**Vern Lough**; mechanic—**Ola Olsen.**

* * *

Frank J. McCarthy is resident superintendent for Brown & Matthews, Inc., New York City, who are putting up a $500,000 office and warehouse building at El Segundo, Calif., for Helena Rubenstein, Inc.

* * *

Bill Loy is superintending a $680,000 highway job for Fredericksen & Kasler, consisting of 4.1 mi. on Highway 101 near Newbury Park, Calif. Work includes a bridge, 3 culverts and 93 small structures. **Jack Skaggs** is structural superintendent. Among other supervisory personnel are **J. R. Beadles,** pipe superintendent; **"Slim" Ransdell,** master mechanic, and the following foremen: **Fred Reasoner** and **Jesse Saylor,** carpenter; **"Sandy" Sandlin,** grade, and **Carl Nelson,** rock. **F. H. McBee** is in charge of the office. For the State Division of Highways, **Larry Higley** is resident engineer, and **Lester Reese** is bridge engineer.

* * *

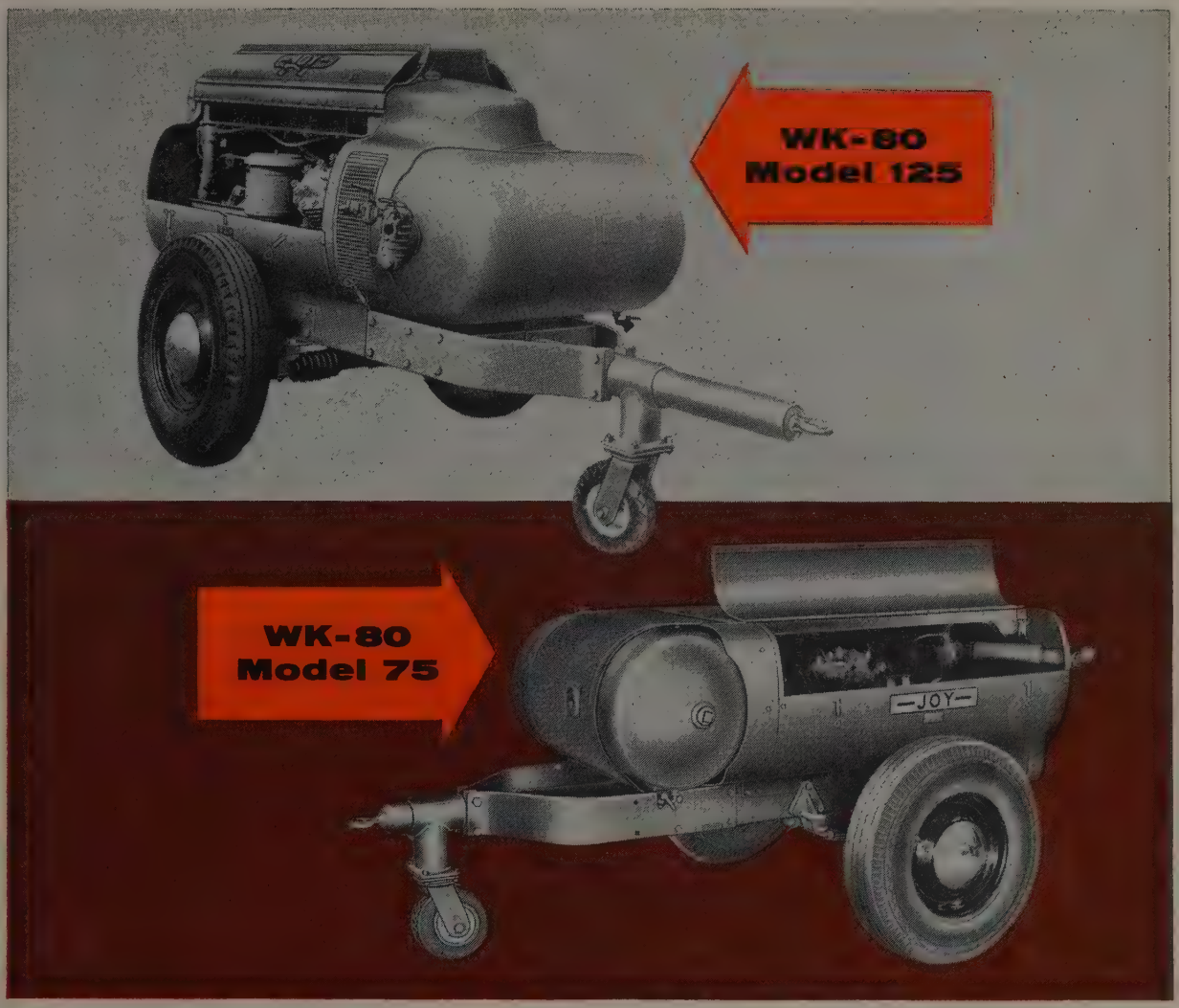
Joe M. Stockton is superintendent for Piombo Construction Co., contractor working on a $3,500,000 contract for highway construction on the Bayshore Freeway from San Mateo to Redwood City, Calif. **Bud Kerr** is assistant superintendent. Other supervisory personnel are the following foremen: **Carl Frandsen,** structures; **Willie Hathaway,** concrete; **Art Bresnan,** grade; **Richy Piombo,** general labor; **Clarence Yturriaga,** quarry; and **Paul Fry,** master mechanic. Office manager is **Tom Shallenberger,** and **Al Moon** is paymaster.

* * *

Al. Rushton is superintendent for Hoefer Construction Co. on the erection of the insecticide building nearing completion on the Riverside campus of the University of California.

* * *

Bliss H. Oliver is project manager, **A. J. Huber** is superintendent and **W. D. Bales** is assistant superintendent for a $2,500,000 contract being exe-



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CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY

cuted by Vinnell Company, Inc., for Northrup Aircraft, Inc. This work involves clearing of an industrial site at Palmdale, Calif. On another Vinnell contract in the amount of $1,000,000 covering outside utilities at the same site, **N. C. Hester** is assisting in the grading superintendent spot.

* * *

Domenic Leone is superintending a $124,220 contract for 10 mi. of stabilization and surfacing on State Highway 12 between Bloom and Timpas, Colo., for Domenic Leone Construction Co., Inc. He has the assistance of **George J. Gahm,** foreman.

* * *

Earl L. Jordan, who himself is a general contractor, is supervising construction on the new Schlacher office building at Riverside, Calif. **Henry Holt** is carpenter foreman. This $250,000 structure will be ready for occupancy in a few months.

* * *

Lorne Peat is superintendent for Stephen F. Owers, contractor on the $500,000 construction of 5 multi-purpose additions to schools in Colton, Calif. Carpenter foremen are **George Brown, Jim Farris** and **Gerald Allen. Harold W. McMahon** is inspector for the Colton school district.

* * *

Raymond F. Anderson, superintendent, and **Harry W. Hale,** assistant superintendent, head the construction crew of James I. Barnes Construction Co. on the erection of the nearly $1,000,000 addition to Stockton College, Stockton, Calif. **William Palmer** is general foreman, assisted by **Charles Neighbarger,** carpenter foreman, and **Robert W. Putman,** labor foreman.

* * *

Esby C. Young of E. C. Young & Co., and **Frank M. Witherspoon** and **Gregory Martinez,** members of the firm of Service Construction Co., are supervising the $463,580 award recently won by the joint firm for improvements on San Gabriel River Parkway, Peck Road to Beverly Blvd., El Monte, Calif.

* * *

George Fortier is general superintendent on the nearly completed $2,000,000 addition to the American Can Co. plant in Stockton, Calif., contract for which is being executed by Larson & Larson. Other men with work under their supervision include **K. M. McFarland,** general carpenter foreman; **Arnold Kimble,** millwright; **William G. Bright,** in charge of welding.

William Bold, assistant manager of the engineering department of American Can in San Francisco, is in charge of the engineering aspects of the job for the company, assisted by **William Orme** in the field.

Subcontractors under Larsen & Larsen are: Fearey Plumbing & Heating Co. with **N. O. McLean** as superintendent and **C. H. Parvin** as fitter foreman. Collins Electric Co., with **J. R. Schmidt** superintending, and paint contractor Russell, Hinton Co., with **Walley Burglin** as general foreman.

SAFETY

Job accidents take their toll

THESE were the accidents that resulted in death or serious injury on the West's construction jobs during the last reported month.

Bernard E. Johnson, 34, Ione, Wash., a worker employed to clear rock from a pit at Albeni Falls Dam on the Pend Oreille River, was killed by a rockslide on March 26.

Frank Herman, 66, bulldozer operator employed by the Shoshone County, Idaho, highway department, was killed April 1 when a two-pronged snowslide thundered off a cliff while a crew of men were engaged in opening a snow-clogged road 25 mi. south of Wallace, Idaho.

ACCIDENTAL DEATHS and serious injuries on the West's construction jobs are reported each month in the interest of promoting safety-on-the-job.

Harold F. Hanson, 26, a Spokane, Wash., steel worker, died March 24 as a result of injuries suffered in an 80-ft. fall from a girder when a cable snapped. He was working on a grain-elevator construction job at the time.

Mate Saftich, 55, construction worker, met his death March 8 when he fell from a low scaffold while working on a building construction job for V. & R. Petersen Co., Reno, Nev. The scaffold was not more than 10 ft. from the ground, but apparently Saftich fell on his head and died instantly.

Harold Gentis of Compton, Calif., was crushed to death by a heavy metal beam when a big steel water tower collapsed while under construction at Las Vegas, Nev. **C. J. Rusher** and **Early Dungy** were severely injured. Gentis and Rusher were riding the beam which was being lifted into place by a winch, which slipped. Rusher was thrown clear, but Gentis was crushed by the beam. Dungy, the winch operator, was thrown about 30 ft.

Unique design matches new floor heights with old

ALBERT C. MARTIN & Associates, engineers, and Guy F. Atkinson Co., contractor, have the exacting job in Los Angeles of "matching up" a modern 4-story annex to the soaring, striking, black-and-gilt Richfield Oil Building. Engineering is complicated by the need for duplicating story heights of 10 ft. 9 in. and 11 ft. 9 in., even while designing to include a modern air conditioning system. Construction is hampered by site conditions: a 46-ft. interior lot underlain by unmapped underpinning of an earlier structure, and access only from a major Los Angeles Freeway feeder street.

Prestressed concrete has helped provide the answer for both engineer and contractor. Maintaining story heights with any other engineering material would have been difficult, according to J. E. Martin, particularly in the case of steel or precast concrete members that might have been fabricated elsewhere, requiring transport to the job on busy streets and stockpiling in virually non-existent space. "As it is, the transit-mix trucks are going to face a continual traffic problem in getting to the work," he observes.

A prestressed floor system of the type used here has not previously been applied to multi-story construction in this country. Columns of reinforced concrete will be poured in place, and so will the 3½-in. floor slabs, the latter being poured integrally with 12 x 22-in. beams. The slab will be post-tensioned in both directions (and from both ends) by five clusters of wires spaced at 7½-ft. centers. Each beam will contain six post-tensioned units, stressed from one end only.

An early job problem related to underpinning of unknown extent, left over from an earlier structure. The problem was partially solved by keeping all annex foundations a minimum of 5 ft. from property line on the Richfield Building side. Under this plan, belled caissons were put down without too much trouble and erection takes off from there—columns, bearing walls, clear-span beams, and prestressed floor system.

Flexibility of interior arrangement also comes with the clear-span prestressed design. Drywall partitions on steel studs are being used, and can be placed where desired and when desired without future consideration of structural matters.

Erection of the building is now well under way, with Jack Smith the project engineer for Guy F. Atkinson Co. Graham Brothers is supplying 5,000-psi. transit-mix concrete for the job, using high-early cement. Roy Van Orden was the project engineer on the staff of Albert C. Martin.

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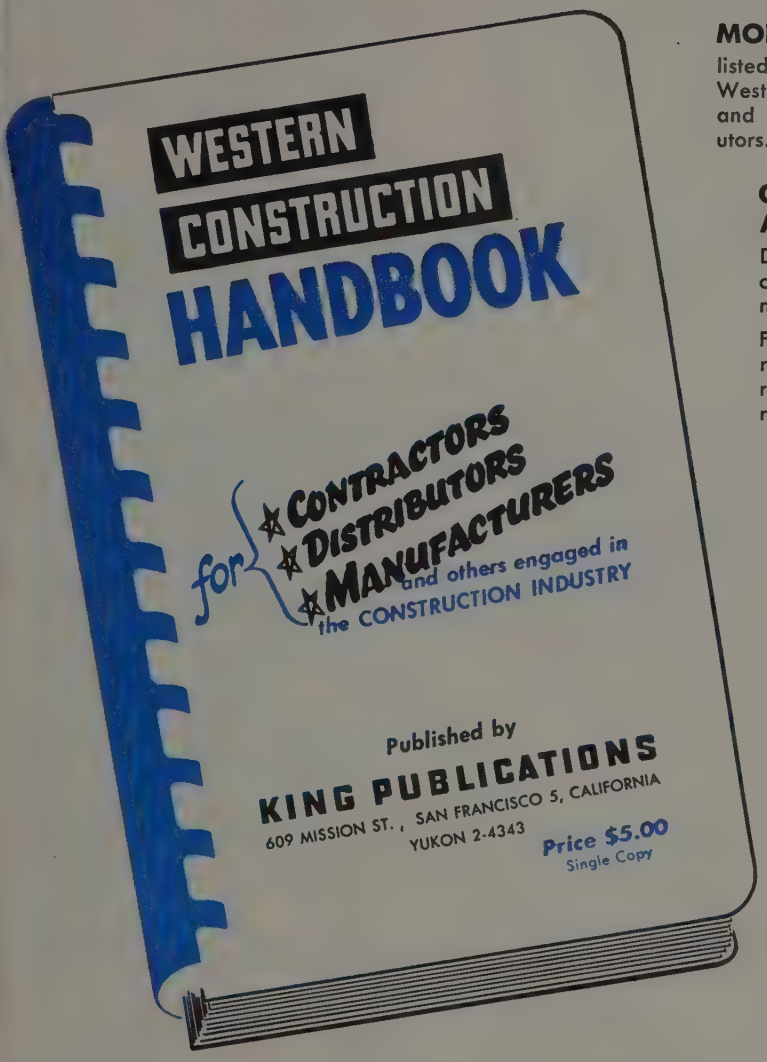

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VERMILION DAM

. . . Continued from page 52

for all embankment compaction. Two of these compactors, by the use of a recently designed gooseneck coupling, were powered by DW21 tractor units. This combination resulted in greater maneuverability and pulling power over the conventional 4-wheel tractor units, especially for the first passes over soft material.

Lights for night operations on the fill and also the borrow pits were 10-kw. diesel generators individually mounted on skids with 1,500-watt lights attached to 25-ft. towers anchored to the skids. These were easily moved by any type of tractor unit.

The fact that 2,075,000 cu. yd. of embankment was placed in the dam between June 15 and November 10—almost 575,000 cu. yd. over the estimate—emphasizes the axiom that the best available equipment, properly maintained, pays off in production.

Excavation for the outlet works, including the outlet and inlet channels and the trench for the outlet channel through the dam, was completed about the middle of August. About 3,000 cu. yd. of heavily reinforced concrete was placed in the 800-ft. horseshoe conduit and the intake and stilling pool structures completed to a point where the gate installations can be made during the 1954 working season. Eventually a 54-in. steel pipe, freely supported in the concrete conduit, will be installed for the normal discharge of stored water. At present the conduit is being used for the winter diversion of Mono Creek and is large enough to handle the normal run-off next spring. However, a gap in the embankment, approximately over the original channel, was left in case the capacity of the conduit is exceeded.

A toe drain trench was excavated in the foundation just inside the downstream toe of the embankment and filled with graded filter material ranking from washed sand next to the foundation and covering embankment to a 1½-in. to 6-in. cobble core. The cobbles were screened over a grizzly and the intermediate and fine filter sizes run through a plant.

Drilling of a series of 16-in. relief wells and 6-in. observation wells was started but not completed the first season. The relief wells are piped into the toe drain for discharge.

Included in the 1954 work in addition to completion of 3,000,000 cu. yd. of embankment and protective riprap and other features started but not completed, will be the construction of the controlled and emergency spillways located at the opposite abutments, installation of micro-wave equipment for remote operation of the 48-in. control valve in the outlet works and the building or relocation of certain roads and trails required by the U. S. Forest Service in the vicinity of the project.

For Southern California Edison Co., executive supervision is by W. L. Chadwick, vice president in charge of engineering and construction. Other members of the engineering department closely connected with the project include R. W. Spencer, manager of the engineering department; T. M. Leps, chief civil engineer; O. N. Kulberg, chief construction engineer, and the author, resident construction engineer for the duration of the project.

Bechtel engineering and construction is under the direction of John Kiely, vice president and Power Division manager. Maurice L. Dickinson is chief hydraulic engineer in charge of design. Field supervision is headed by K. O. Taylor, general superintendent, and George Saul is project superintendent in charge of construction forces.

NEW CAULKING MATERIAL

. . . Continued from page 60

leakages per mile, per day, per inch diameter of pipe were as follows:

10-in. pipe (1,365 ft. of line)—324 gal.
12-in. pipe (3,426 ft. of line)—123.6 gal.
15-in. pipe (7,710 ft. of line)—243 gal.
18-in. pipe (3,662 ft. of line)—436 gal.
21-in. pipe (1,787 ft. of line)— 11 gal.
24-in. pipe (914 ft. of line)—147 gal.

In only one instance was the allowable leakage of 400 gallons per mile, per day, per inch diameter exceeded, and this was an instance in which it was impossible to completely plug one end of the pipe during the test.

On the basis of its performance at San Pablo, Sealite caulking yarns appear to be the solution to the long-standing problem of how to take advantage of the recognized advantages of vitrified clay pipe and at the same time obtain economical, watertight joints. In the writer's experience, the results achieved by the use of this yarn, hot-poured bituminous compound, and vitrified clay bell-and-spigot pipe are superior to those obtainable by any other means.

The writer wishes it known, for ethical reasons, that because of his personal knowledge of the research and development behind Sealite caulking yarn, and his belief in its ability to solve the infiltration problem, he has become a stockholder in Sealite, Inc., the manufacturing firm. The qualities which recommended the yarn to the writer are those which have been described above as contributing to the economy of the San Pablo project.

Personnel working for the writer were Lloyd Allen, chief engineer, and the following resident engineers: Ben Race, Peter Vogel and Andy Anderson. For Marvin Collins, Ltd., J. Doffiemeyer was project manager and Wayne Thompson, field superintendent. For Prodanovich, Krzich, and Rodrigues, Dan Prodanovich was project manager, Louis Krzich and Vincent Rodrigues were field superintendents, and Stanley Tormey was timekeeper. For Kevry Construction Co., Edward Vadnais, Jr., was project manager and "Blackie" Hunt field superintendent. For Associated Engineers, T. C. Binkley was project manager and Jack Gueld was field superintendent.

C. of E. projects for 1953

THE CORPS OF ENGINEERS completed 190 projects, at a cost of $145,098,108, during the fiscal year of 1953. An estimated 4,045 other jobs, totaling $2,130,291,000, were in progress, at the first of the year, in the continental United States. Maj. Gen. S. D. Sturgis, Jr., Chief of Engineers, reported that construction contractors received 93.4% of each dollar that went into the completed jobs.

Design criteria for concrete dams

ENGINEERING MONOGRAPH No. 19 on "Design Criteria for Concrete Gravity and Arch Dams" has been released by the Bureau of Reclamation. Its contents were formulated by a special panel of 11 engineers of the Bureau appointed in 1949 by the Chief Engineer to make studies to insure such procedures and criteria that USBR gravity and arch dam design practices would be consistent with best current knowledge and concepts.

The panel was composed of **J. J. Hammond**, chairman; **E. R. Dexter, R. E. Glover, Douglas McHenry, John Parmakian, L. G. Puls, J. M. Raphael, Roger Rhoades, A. W. Simonds, C. N. Zangar,** and **F. D. Kirn,** author of the monograph. Kirn, in conjunction with **G. S. Sarkaria,** wrote an article reviewing the grouting of construction joints in concrete dams which appeared in *Western Construction* —Mar. 1953—p. 74.

Copies of the booklet can be obtained from the Bureau of Reclamation, Denver Federal Center, Denver, Colo. Price 30 cents.

SECO-IZING: BETTER SIZING

at the new modern light slag plant of

LORAIN SLAG CO.

Lorain, Ohio

Progressive Operator Has Four SECO Workhorse Screens on the Job

Here's another on-the-job performance story that dramatically points out the dependability of SECO Vibrating Screens. Pictured above are a 5 x 14 SECO (rear above) and a 5 x 12 (front) SECO taking the load smoothly and effortlessly in the modern, efficient plant of Lorain Slag Co. With these two screens and another 5 x 12 sizing screen and a 4 x 8′ scalper they have a winning team in getting production out, accurately sized and on schedule with a minimum of maintenance. Finished sizes include plus and minus ⅜″ and 3/16″.

How about your screening problems? Why not get the advantages of SECO engineering exclusives for accurate, high production results on your job? You name the material, from Ag-Lime to Rip-Rap, and we'll recommend the right SECO vibrating screen for the job. Get the whole SECO story, today! No obligation. Write, wire, phone.

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TRICKS of the TRADES

Wire rope used to support cab roofs on logging tractors in Washington

A NEW JOB for wire rope, that of supporting the cab roofs on tractors, has been pioneered in Washington by the Biles Coleman Lumber Co. of Omak.

For reasons of safety and economy, this use of wire rope has been standard practice in the Coleman operations for several years. All eight of the company's tractors are outfitted with wire rope-supported roofs. The E. T. Pybus Co. of Wenatchee has been supplying Bethlehem Purple Strand to the Biles Coleman people for this purpose since they first got the idea.

Practice increasing

From all indications, the practice is being adopted by an increasing number of logging and construction outfits in the Pacific Northwest.

The flexibility of wire rope greatly increases the protection which a cab roof is supposed to offer the operator, according to Pierce Aston, in charge of logging equipment for Coleman. It affords plenty of "give" if anything hits the cab roof, so instead of a falling log crushing or breaking a rigid steel frame cab, it merely causes the wire rope supports to bend with the pressure. Aston says this could easily save an operator's life in some situations. The Washington State safety code approves the use of wire rope as cab supports on heavy equipment.

Lower maintenance costs

Aston points out that maintenance costs are reduced since wire rope will not break under continuous vibration as will steel pipe, the material usually used for cab roof supports. Wire rope is also much easier to bend and install than pipe, and does not require the bolting down that pipe does.

Pipe is still used, but only as seatings for the wire rope. The cab roof can be raised or lowered simply by adjusting the wire rope in the pipe seating. These supports also do away with much of the clatter of a tractor in operation, since wire rope will not transfer noises to the cab roof.

Engineers' recommendations

For this purpose, wire rope engineers recommend a 2¼-in. or 2⅜-in. wire center rope. This is heavy and stiff enough to provide sufficiently strong support without possessing the complete rigidity of a steel pipe support.

WIRE ROPE holds up the roof cab of a tractor operated by Pierce Aston, who is in charge of Biles Coleman Lumber Co. logging equipment. This photo was taken in the company's Omak, Wash., log storage area.

Ditch-cleaning method eliminates hauling

OFFICIALS of Yamhill County, Oregon, have devised a new ditch-cleaning method that practically eliminates the need for hauling equipment. Located in the hilly and mountainous country about 50 mi. southeast of Portland, most of the county's roads are on the sides of hills. Hence, only the uphill side of the road presents a ditch-cleaning problem.

Ditch cleaning has been simplified and costs lowered with this method: First, a Caterpillar motor grader blades all the surface gravel to the downhill edge of the road. Then the grader goes back along the road, cleaning the ditch and pulling berm onto the road bed. An Athey Force-Feed HiLoader then takes over, picking up the berm and debris and casting it onto the downhill shoulder. The HiLoader has a swiveling 13-ft. conveyor that swings far out over the shoulder. The surface gravel is then bladed back over the road.

Objectives accomplished

With just two pieces of equipment, Yamhill County has accomplished three objectives with this procedure: ditches are cleaned quickly and efficiently, all surface gravel is saved and re-used, and down-hill shoulders are built up to provide a safer, wider roadway.

Here's why a Texas contractor finds

IT PAYS TO BE ALL-CAT*

E. E. Hood and Sons of San Antonio, Texas, are 100% Caterpillar-equipped. Ranney V. Hood, co-owner of the firm, tells why:

"We feel that Caterpillar equipment is the best made.

"We can move half again as much material in the same amount of time.

"If we have to work on our Cat machines, parts are easy to get and repairs are easy to make."

The Cat-powered Bucyrus-Erie 1½-yard shovel shown here makes a swing in less than 15 seconds, loads a five-yard truck in 54 seconds. That's fast, cost-cutting production! The firm is reconstructing farm-to-market highway No. 346, south of San Antonio.

In addition to the Caterpillar D13000 in the shovel, Hood and Sons own two D13000s in a crusher, four Cat No. 12 Motor Graders, seven Caterpillar track-type Tractors, and two Cat rubber-tired Tractors with Scrapers.

Mr. Hood especially likes the dependability and low operating costs of Caterpillar products. The D13000 in the shovel has cut production costs through nearly 8000 hours of pamper-free operation. And, like all Caterpillar Diesels, it can deliver full power, and idle without fouling, on low-cost No. 2 furnace oil.

Experienced contractors like Mr. Hood find valuable "pluses" in standardizing on Caterpillar products: increased operator familiarity, ease of maintenance, simplified parts inventory. There are 12 Caterpillar Engines and Electric Sets, to 500 HP and 315 KW. Your Caterpillar Dealer—who furnishes fast, skilled service and genuine factory parts—will help you pick the unit that's just right for *your* needs. When you repower, or order new equipment, be sure to specify Caterpillar power. Leading manufacturers of excavators, compressors and other construction machinery can furnish Cat Engines in their equipment.

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

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

A WORD TO THE WISE— STANDARDIZE!

TOOLS of the TRADES

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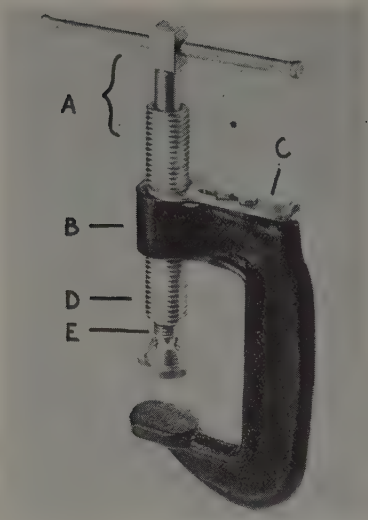


501

A C-CLAMP with pressure screw that adjusts in length has been developed by **Techno Products, Inc.** This is how it works. A quarter-turn in either direction releases the pressure screw assembly (A) so that it slides freely in and out of the threaded hub (B). In this way the disengaged pressure screw assembly can be positioned against the work, re-engaged, and then tightened in the usual manner. A sliding thumb lock (C) holds the pressure screw assembly in engaged position. This adjustable action is accomplished by having two sides of the outer barrel (D) milled flat to match corresponding grooves in the inside diameter thread of the hub. Thus, the entire length of the pressure screw (E) is quickly available.

Excavation manual

HOW TO OPERATE excavation equipment has been described in simple, non-technical language in a 150-page book written by Herbert L. Nichols, Jr. He has operated his own excavation and grading business for 15 yr., with the exception of 5 yr. he spent doing similar work for the Army and Seabees overseas. The book, entitled "How to Operate Excavation Equipment," breaks the various types of equipment down into separate chapters. It contains a number of drawings showing the complete machinery, cutaways showing control stations, charts showing various types of operating positions and drawings.

Types of machinery described in some detail include revolving shovels, draglines, cranes, conveyor machinery, dredges, tractors, bulldozer blades, front-end loaders, scrapers, dump trucks, graders, rollers, and other miscellaneous equipment. A glossary of construction terms is included in the back of the book.

Published by North Castle Books of Greenwich, Conn., 1954. This 6½ x 9½-in. book comes in three different priced editions; the cheapest is $1.50.

502

A NEW MODEL torch for heavy duty work, the J-5, has been added to the line of cutting and gouging torches manufactured by the **Arcair Co.** The new torch is designed to cut and gouge all metals using only electric arc and compressed air. It features a solid, one-piece insulated head that holds the electrode at a fixed angle to provide better electrode contact and less heat. A spring-loaded plunger holds the electrode firmly in place and also acts as automatic air valve. The air is on as long as the electrode remains in the torch. This eliminates hand grip controls and permits the torch to be operated in any direction or position without the need of adjusting electrode angle and air controls or changing grip on handle. Two heads, one for ⅜ and one for ½-in. electrodes are supplied with each torch. Special features of the 14-in.-long torch include an insulated metal hand shield and heavy-duty concentric cable.

503

180-PAGE MANUAL—Maintenance and operation of automotive electrical systems

Text, wiring diagrams and hundreds of pictures "take apart" the seven basic circuits of the electrical system, providing a complete service manual to be used in testing and adjusting. Trouble shooting charts tell you how to locate and eliminate troubles. Test specifications for all electrical units are printed in a separate book, also available. The two books provide a complete and practical education, covering every detail but easy to understand. Compiled by Parts and Service Division of **The Electric Auto-Lite Company.** Use key number to obtain your free copy from *Western Construction.*

504

SOLDERING TOOL—The Solder-Quik soldering tool has been announced by the **Stark Manufacturing Co.** Recommended for light soldering operations, the tool operates on a regular 110-v. alternating current line through a step-down transformer. It is 8¾ in. long, takes 2-in.-long carbon electrodes and 5/37-in. dia. electrodes, and needs ½ in. clearance for its tip. Power consumption ranges from 5 to 250 watts, depending on the heat used. Free literature available.

505

MULTI-TOOL BENCH—The Porter-Cable Machine Co. has introduced a stationary multi-tool bench from which various units can be detached to serve as portable tools. The bench can easily be moved to any location or even mounted on wheels for more convenient moving. Basis for the Model 5013 Porta-Shop is an all-steel work bench, 45 in. long by 24 in. wide, which was specially designed to convert any portable electric tool into a stationary machine. An electric box contains a switch and outlet for convenient control of power tools. The table is equipped with a sliding miter gauge, a rigid rip fence guided on a steel rail, a vertical drill press, a stationary abrasive-belt horizontal bench sander, the Porter-Cable Combo-Tool, a shaper-jointer, and provisions to make a table saw from any of the company's eight electric hand saws. Free literature available on request.

506

DIFFERENT WELDING ELECTRODE—Air Reduction announced a new type welding electrode, known as Easyarc 12, for welding mild steel at speeds doubling those obtained with conventional electrodes. This speed is achieved through the addition of powdered metal to the electrode coating. This changes the arc action so that welds can be made by dragging the electrode in contact with the plate so that the metal powder becomes part of the weld bead. Weld spatter is decreased to less than half. This electrode is recommended for the fabrication of mild steel involving plate and rolled sections. Free literature available.

507

SAW BLADE BULLETIN—A three-color illustrated bulletin describing its new line of low cost, carbide-tipped blades designed for use with radial saws has been issued by the **Delta Power Tool Division of Rockwell Manufacturing Co.** It has pictures of typical operations, recommended uses for the new blades, and catalog specifications. Fill in the coupon to get your free copy.

508

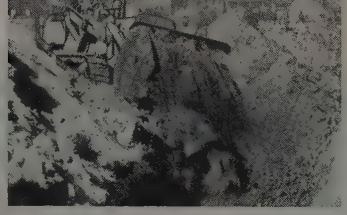
FASTER ELECTRODE WELDING—A high-speed build-up welding electrode offering a 20% faster deposition rate which helps to preserve the desirable properties of manganese steel is described in Bulletin A, published by **Rankin Manufacturing Co.** Application procedures, specifications, and prices are listed in the bulletin, which may be obtained by filling in the coupon.

509

LOW-NITROGEN STEEL ELECTRODE—An all-position, AC-DC (reverse polarity) welding electrode for use on carbon, low-alloy, and high-strength steels has been announced by **All-State Welding Alloys Co., Inc.** This low-nitrogen steel electrode is described as good for inexperienced welders because it won't freeze to the work if held too close and the arc length is automatic. Contact with the grounded work is sufficient, regardless of position. The new product, identified as Monoweld No. 1 Special, is described as conforming to the AWS-ASTM Specifications A-233-49T for E-6013 Class. Available in 3/32, ⅛, 5/32, 3/16, and ¼-in. core diameters.

ckpiles sand, aggregate. Has ction and flotation to work ht up on the pile.

Excavates, fills, levels. Compact — for work in limited areas.



Backfills ditches, packs and levels ground with 16,200 lb. weight.

Cleans up rubble with one-cu. yd. tractor-width bucket.

s material where needed. Saves npower and need for other uipment.

Does sanitary fill work — digs, fills, covers, levels.

es drawbar work scraping . . . ling.

Landscapes, grades or slopes lawn areas around building projects.

TEN QUICK-CHANGE ATTACHMENTS ADD TO HD-5G VERSATILITY

lldozer grades, stockpiles, ars. Angledozer blade also ilable.

Trench hoe digs flat bottom ditch 27 in. wide to 8 ft. depth, ½-yd. bucket.

Ripper scarifies to 12 in. depth. Increases shovel or dozer output up to 30 percent.

plus

Narrow Bucket	Lift Fork
Rock Bucket	Tine Fork
Crane Hook	Rock Fork
Light Material Bucket	

ALLIS-CHALMERS HD-5G

Always Busy...

because it does so many jobs so well!

Busy equipment is profitable equipment. And thousands of owners are learning every day the year around that there's no more profitable machine on their jobs than the one-yard Allis-Chalmers HD-5G Tractor Shovel.

Loads sand, dirt, gravel — a material to dumping height of ft, ¼ in.

Larger size Allis-Chalmers tractors with shovels and other quick-change attachments offer the same wide utility, the same outstanding performing ability as the popular HD-5G. Choose the one that fits your needs.

1-YD. HD-5G	2-YD. HD-9G	3-YD. HD-15G	4-YD. HD-20G
40.26 drawbar hp.	72 drawbar hp.	109 drawbar hp.	175 net engine hp.
Dumping height*	Dumping height*	Dumping height*	Torque Converter Dri
9 ft., ¼ in.	11 ft., 4 in.	12 ft., 8 in.	Dumping height*
			13 ft., 5 in.

*Height of bucket hinge

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

IDAHO
Southern Idaho Equipment Co.—Idaho Falls and 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
Moore Equipment Company—Reno

OREGON
Papé Brothers—Eugene, Roseburg and North Bend

OREGON
Dielschneider Tractor Company—The Dalles
Haupert Tractor Company—Medford
Wood Tractor Company—Portland

UTAH
Cate Equipment Company, Inc.—Salt Lake City

WASHINGTON
A. H. Cox & Company—
Seattle, Tacoma and Wenatchee
American Machine Company—Spokane

WYOMING
Studer Tractor & Equipment Company—Casper

"DELIVERY ON THE ROOF"

What would you do if you were confronted by school board bid specifications which demand that an order of shingles for a local grammar school be "delivered on the roof"?

***J. B. Ruth*, manager of the Clay Building Materials Co. at Comanche, Tex., put his imagination in high gear to figure out a means of underbidding all his competitors by using the reverse gear on his Willys Jeep.**

His main objective, of course, was to get the bid and still not lose any money in the process. After he got the bid, here's what he did:

"We fastened roller conveyors on a frame from ground to roof. A cable was run through a pulley at the top of the frame and fastened to the front of the Jeep. The bundles of shingles were then pulled to the roof by backing up the Jeep," he explained.

Safety in the quarry

"SAFETY IN QUARRY OPERATIONS" has been published by the National Safety Council to provide operators of quarries and related industries with the basic information needed to build and maintain an effective safety program. It covers such topics as safety committees, accident investigation and records, and medical and first-aid facilities. Specific problems discussed include scaling the face, ingress and egress from pits, drilling, explosives, railway and truck transportation, and other topics. Data sheets, particularly those relating to the prevention of accidents from falling rock and the operation of heavy duty trucks, supply information on safe practices. The 40-page, two-color cover booklet is illustrated with both photographs and diagrams. It is available to council members at $1.25 each, to nonmembers at $2.50 each. Quantity prices may be obtained. Published by the National Safety Council, 425 North Michigan Ave., Chicago 11, Illinois.

NEW LITERATURE

Free copies of any of the items in this section may be obtained by using coupon on page 131.

510

Wire rope assemblies

Macwhyte Co. has published a new catalog which lists wire rope assemblies for machine parts and operating devices. It is called "Macwhyte Safe-Lock Industrial Standards Wire Rope Assemblies," Catalog 5201. This 22-page, two-color booklet is loaded with specifications for each assembly, and each is illustrated by photograph and drawing.

511

Joy paving breakers

Joy Manufacturing Co. has issued Bulletin 87-P covering the Joy line of Silver Streak paving breakers. The 8-page booklet contains specifications, descriptions, and photographs of the four sizes of paving breakers. The bulletin also describes air compressors, rock drills, and other related tools.

512

Use of vibration in making concrete pipe

The Viber Co. has published a 10-page booklet giving facts and figures on the application of external vibration in the manufacture of cast concrete pipe. It discusses the reasons for applying vibration and offers suggestions as to how to get the best results. Various types of vibrators, including their specifications, are discussed. Also included is a cutaway view showing the main parts of a vibrator, as well as job photographs of the vibrators in action.

513

Concrete shrinkage control

A. C. Horn Co., Inc. has published an 8-page, color booklet called "Vibro-Foil." It describes the metallic aggregate which is used for non-shrink resurfacing of concrete floors, patching, and bonding of concrete surfaces. The booklet covers the properties of this material and contains suggestions on preparation of foundations for heavy equipment plus specifications. Recommended for engineers, contractors, maintenance superintendents, and architects.

514

Austin overshot loaders

A 2-color, 4-page catalog, describing Austin Overshot Loader Models 4-C and 6-C, has been published by **Austin Division, Central Ohio Steel Products Co.** It contains specifications, drawings of the loader in action, and numbered photographs showing special features. Other photographs show various types of the loaders in action. These loaders are engineered for use with Caterpillar D4 and D6 tractors respectively.

515

Charge-a-Paver

The Thew Shovel Co. has published a 4-page booklet describing the Lorain TL-25 Charge-a-Paver. A step-by-step explanation, complete with illustrations, describes how concrete highway paving costs are lowered and paver output increased with the use of this new front-end attachment.

516

"Terratracs and their equipment"

American Tractor Corp. has published an 8-page, full-color booklet entitled "Terratracs and Their Equipment." It contains specification tables for each type of equipment manufactured by the company, job photographs showing the machinery in action, and color drawings and descriptions of each item.

517

Amercan Hoist shovel-crane

American Hoist & Derrick Co. has published a 6-page, full-color catalog on a new 1½-yd. shovel, 35-ton crane. It contains specifications showing uses as crane, shovel, and dragline. Also job photographs showing the machine in action in various situations. A silhouette photograph points out the specific advantages of this machine.

518

Portable two-ton roller

Andwall Manufacturing Co. has published a 4-page, 3-color bulletin describing the new Andwall portable tandem 2-ton roller. It contains a full page of specifications, photographs showing the roller in action on jobs, and recommended uses.

519

Portable concrete plant

"Auto-Crete" is the name of an 8-page, full-color brochure describing this new portable, automatic concrete batching and mixing plant. Contains a specification table and lots of pictures giving illustrations of how it works and how to work it. Descriptions are in large-size, easy-to-read type. Designed and engineered by a contractor on the basis of his actual job experience. Manufactured by **Auto-Crete.**

520

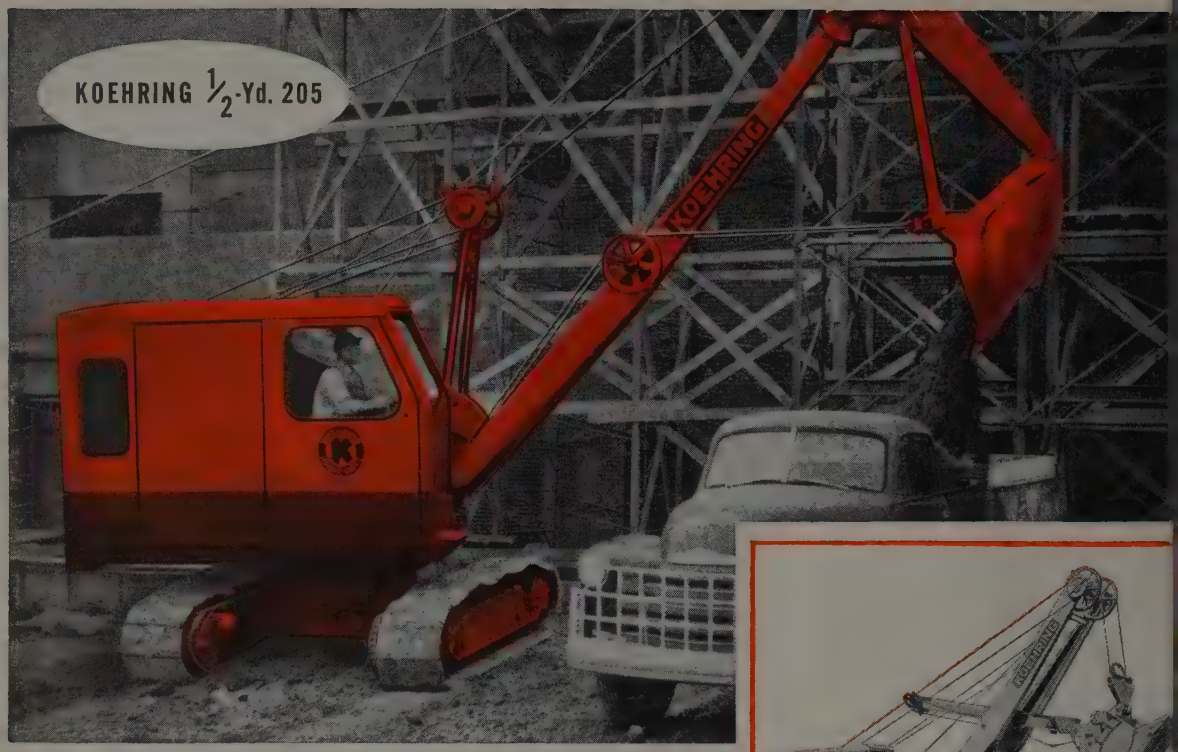
Truck and mixer unit

Cook Bros. Equipment Co. has published a 6-page folder, illustrating and describing the M-310, single passenger, cab-beside-engine truck and mixer unit. Weight breakdown for front and rear axles are included, as is information on the special front-end design.

521

Water repellent bulletin

An 8-page, two-color bulletin describing Daracone water repellent has been published by **Dewey & Almy Chemical Co.** The bulletin contains photographs of what happens to buildings when they are not protected



digs 17¾ feet deep . . . dumps at 10 foot height

With its long, deep reach, Koehring ½-yard 205 hoe digs 17¾ feet below grade . . . has 10-foot clearance height at beginning of dump to load trucks. Maximum cutting width, with side cutters, is 32 inches. During the hoist-and-swing cycle, close-coupled dipper pulls up tight to boom, avoids spillage. Powerful cable crowd, fast line and swing speeds maintain big-yardage production. Heavy-duty, box-section boom and dipper arm resist side-sway in toughest digging. Operators like the 205's ease of operation . . . *you'll* like its EXTRA WORK CAPACITY. Here are some of the heavy-duty advantages you get that increase production with every 205 attachment:

Big 20-inch main drum clutches.

Only 2 major shafts in upper machinery . . . simple, accessible.

Heavy-duty splined shafts . . . carburized, hardened gears.

4 hook-rollers, eccentric adjustment.

Automatic crawler traction-brakes.

Standard or extra-long crawlers . . . with 16, 20, or 24-inch shoes.

Independent traction . . . optional.

Antifriction power-flow for dig, hoist, swing, travel.

Crawler-mounted 205 brings you: ½-yard dipper capacity as a shovel or hoe . . . ½ to ¾-yard bucket capacity as a clamshell or dragline . . . 10-ton lift crane.

Truck-mounted 205 has 15 tons lift capacity, 25 to 55-ft. boom, plus max. 30-ft. jib. Travels 32½ m.p.h. Converts to all standard excavator, crane attachments.

Before you invest in any excavator or crane see us about this Koehring 205.

K487R

American Machine Co., *Spokane, Washington*
Pacific Hoist & Derrick Co., *Seattle, Washington*
Columbia Equipment Co., *Portland, Oregon*
Harron, Rickard & McCone Co. of Southern California, *Los Angeles, California*
Standard Machinery Co., *San Francisco, California*
Kimball Equipment Co., *Salt Lake City, Utah*
Neil B. McGinnis Co., *Phoenix, Arizona*
The Harry Cornelius Co., *Albuquerque, New Mexic*
San Joaquin Tractor Co., *Bakersfield, California*
Engineering Sales Service, Inc., *Boise, Idaho*
McKelvy Machinery Co., *Denver, Colorado*

522

Industrial plastic bulletin

Joseph T. Ryerson & Son, Inc. has published a 16-page illustrated bulletin on industrial plastics containing data on the manufacture, grades, properties, fabrication, and use of laminated plastic sheets, tubes, rods, and special shapes. It contains several pages of specifications showing the average characteristics and properties of the various grades of plastic available. Drawings and photographs illustrate the items discussed. A special section gives instructions for machining or other working of this plastic.

y a water repellent compound and utlines the advantages of using this articular compound. Also contains ob specifications, water absorption ables, application photographs, and omparative photographs showing on-protected and treated masonry. Various tests are described.

iterature briefs . . .

523

HOULDER MAINTENANCE — ow to have safe shoulders at low ost is explained in Booklet MS-896 ublished by **Allis-Chalmers Manufacturing Co.**

524

GASOLINE RAMMER — **Barco Manufacturing Co.** has published Catalog No. 621, which describes its gasoline rammer in action.

525

ASPHALT LININGS—**Gulf States Asphalt Co.** has published an engineering brochure to help in the evaluation of Gulf-Seal, exposed-type, prefabricated asphalt linings.

526

SERVICE DITCHER—Model 705-B Runabout service ditcher is described in an 8-page booklet published by **Barber-Greene Co.**

527

ELECTRIC HOISTS — Bulletin WC4E, published by **Coffing Hoist Co.**, describes its line of Quik-Lift electric hoists.

528

GUARD RAIL—**United States Spring & Bumper Co.** has published a folder on its line of guard rail and supporting post.

529

PUG MILL MIXER—**Madsen Iron Works, Inc.**, has published Bulletin No. 400, which gives the story of the Madsen Model 440 Twin-Shaft Pug Mill Mixer.

530

BELT FASTENERS — Bulletin F-100 describes the line of Flexco belt fasteners and rip plates made by **Flexible Steel Lacing Co.**

531

COMPRESSORS — Gyro-Flo portable compressors are described in Bulletin No. 2321, published by **Ingersoll-Rand.**

532

TRASH RACK RAKE — Leonard trash rack rakes in action are described in Bulletin No. 158, published by **S. Morgan Smith Co.**

533

TRUCK MIXER STANDARDS—Revised standards for truck mixers and agitators are available from the **Truck Mixer Manufacturers Bureau.**

CALENDAR

May 27-29—California Society of Professional Engineers, annual convention and trade show, at Mark Hopkins Hotel, San Francisco.

Sept. 16-18—Western Association of State Highways Officials, 33rd annual conference, at Challenger Inn, Sun Valley, Idaho.

Oct. 14-16—Structural Engineers Association of California, annual convention at Hotel Del Coronado, San Diego.

Oct. 28-29—American Concrete Institute, regional meeting at Statler Hotel, Los Angeles.

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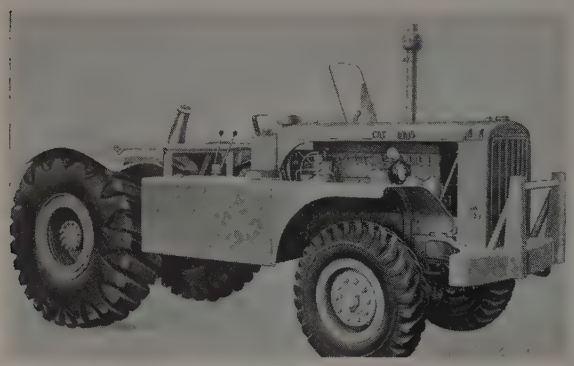
NEW EQUIPMENT

More information on any of the items in this section may be obtained by using coupon on page 131.

534

Cat announces DW15 tractor with 150 hp. engine

Caterpillar Tractor Co. has announced the DW15, a new 150-hp., 4-wheel tractor, powered by a 6-cylinder diesel engine with 5⅛-in. bore and 6-in. stroke, which operates at 1,800 rpm. Features of this engine are aluminum alloy pistons, chrome-nickel steel heat plugs incorporated into the pistons, a triple-duty oil pump, large-capacity wheel brakes with compressed air boosters, an air booster on the flywheel clutch, a foam-rubber seat with adjustable snubber arrangement, and a 75-gal.-capacity fuel tank.



The transmission gives double speed ranges with 10 forward speeds up to 25 mph. and two reverse speeds up to 3.3 mph. Optional final drive gears give a maximum speed of 31.3 mph. Specifications include an overall length of 16 ft. 8 in., wheel base of 121½ in., front tire sizes of 12.00 x 20, 14-ply traction type, and rear tires of 21.00 x 25, 20-ply rock type.

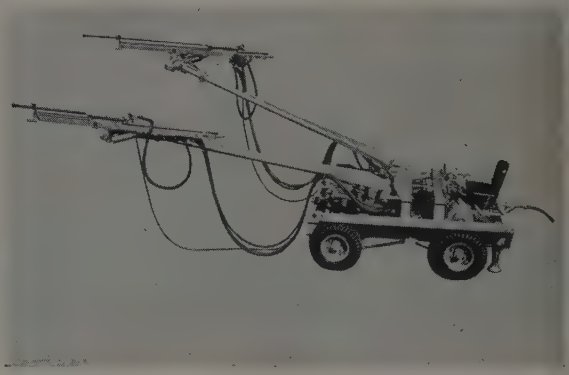
Other features of this new tractor, designed principally for use with the Cat No. 15 and No. 10 scraper and W10 wagon, are improved hitch construction, headlights on the front and rear bumpers, wagon controls, windrow breaker, and a gasoline starting engine with a 6-volt electric starter.

535

New, self-propelled Mobiljumbo comes equipped with complete remote controls

A complete round in drift, tunnel, room, quarry, or rock cut can be drilled out with the new **Gardner-Denver Co.** JSP Mobiljumbo without the operator leaving his seat on the jumbo carriage. Positioning of the booms and drills, as well as the complete drilling cycle, is handled by hydraulic controls in front of the operator. The company's engineers say this new development has been designed to reduce the time, effort, and cost required to drill rock in mines, quarries, and tough excavation jobs.

The control panel consists of a series of levers which raise or lower the machine on jacks for stability while drilling, raise or lower each boom independently, or swing the booms laterally. The drills are positioned by hydraulic cylinders near the end of each boom. These cylinders are also used to move the drills through vertical and horizontal arcs. Thus drills can be positioned for down, up, or horizontal holes. This makes it possible to equip the machine for drilling roof-bolt holes.



All positioning is hydraulically-locked and free from creeping. The complete drilling cycle for each drill, including drill speed, feed pressure, hole cleaning, and steel withdrawal is remotely-controlled from the operator's seat.

Each set of side wheels is chain-driven by an air motor. The carriage can be steered by powering one set of wheels at a time. Various boom lengths are available for drilling of faces up to 14 ft. high. Face widths of 25 ft. can be drilled off from a single setting of the machine. Where underground lighting is needed, the Mobiljumbo can be equipped with an air-motor-driven generator.

536

Light-weight dragline bucket for economical digging

A light-weight dragline bucket, called the RL Dixie bucket, has been developed by the **Page Engineering Co.** for efficient and economical digging. The lip and tooth points are cast of high manganese steel for maximum resistance to wear and shock. The teeth are mounted in bases cast integrally with the lip.

Buckets are available in capacities ranging from ⅜ to 3 cu. yd. Struck measure ranges from 11 to 90 cu. ft., while weights range from 730 to 4,580 lb. The smallest bucket is

Almost like getting

AN EXTRA ENGINE FREE

—the extra engine life you can get with Shell Rotella Oil . . . a remarkable heavy-duty oil that actually stops the major cause of engine wear! Here is how operators in your own field do just that and save hundreds of dollars each year!

IN HUNDREDS of field tests, using equipment similar to yours, scientists have discovered that "acid action"—not friction—causes most engine wear. Up to 90% on the average engine!

Furthermore, these same tests prove that this costly "acid action" is caused by harmful by-products of incomplete combustion and condensation—*which are always present in your engine.*

To stop this "acid action," Shell scientists developed specially fortified Shell Rotella Oil.

The results have been remarkable. The anti-corrosive action of Shell Rotella Oil actually stops "acid action" so effectively that (depending upon the condition of the engine) many operators find the extra hours of operation they can get are almost like getting an extra engine free.

A truly "balanced" oil, Shell Rotella also has highly effective detergent-dispersant and anti-oxidant properties. These enable Shell Rotella Oil to provide unsurpassed engine cleanliness.

Does this save you money? Of course. But look at the *extra* savings, too. With Shell Rotella Oil, your equipment operates so much more efficiently, you save repair and overhaul expenses, engine "down-time" and excessive fuel costs.

If you'd like to figure the savings *you* could make with Shell Rotella Oil, contact your Shell representative soon.

SHELL

SHELL ROTELLA OIL

stops the major cause of engine wear!

35 in. long, 28 in. wide inside the lip, and 20 in. high. The largest bucket is 65 in. long, 55 in. wide inside the lip, and 43 in. high. Perforated buckets are furnished at no additional cost. This bucket is fully described in catalog RL-154, available on request.

537

Speedy fork truck lifts to 122 in.

The Yardloader, a low-cost ($2,985) gasoline engine, 4,000-lb. fork truck, is particularly valuable for yard handling jobs requiring the movement of materials over large areas because of its travel speed of 14 mph. Additional features are large pneumatic tires and high ground clearance. Also, the Yardloader uses an extra-heavy drive axle and an oscillating trail axle to permit its operation over unimproved or semi-improved surfaces. Powered by a

valve-in-head Case industrial engine, the Yardloader has a standard lifting height of 122 in. Manufacturer is **Baker-Raulang Co.**

538

Commercial mixer added to Cedarapids line

A self-contained, portable, twin-shaft, continuous-flow bituminous mixing unit, designed for commercial-type jobs, has been announced by **Iowa Manufacturing Co.** Capacities are rated up to about 40 tons per hr., depending on type of mix, specified mixing time, and capacity of drying and feeding time. The new machine is known as the Cedarapids Model CM Commercial Mixer. It was de-

signed for patching and surfacing such smaller areas as parking lots, school yards and the like.

In the operation, material is fed into the dryer from a two-compartment hopper equipped with a reciprocating feeder. Adjustable bin gates proportion the aggregate according to specifications. The enclosed bucket elevator de-

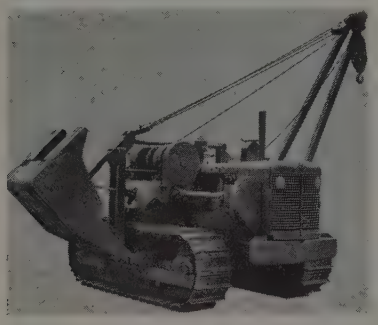
livers multiple hot-mix aggregate to the mixer, where it is mixed to specifications with a constant flow of bitumen from the weight-calibrated metering pump on the mixing unit. The bucket elevator can also be arranged for cold-mix applications or to use a weight-calibrated apron feeder on the mixing unit for single aggregate hot mix. The belt conveyor delivers the finished product to trucks.

These plants can also be mounted for stationary installation to discharge directly into trucks without use of delivery conveyors. For high type of mix, a gradation unit can be used for screening the aggregate into various sizes. This assures a steady flow of accurately-proportioned aggregate to the mixing unit.

539

Side boom designed for Allis-Chalmers crawler tractor

A new side boom with a 38,000-lb. lifting capacity at 4-ft. overhang has been developed by **Tractomotive Corp.** for use with the Allis-Chalmers



HD-9F tractor with 72 drawbar horsepower. Known as Model TSB-9, it was designed to fill requirements of pipeline contractors working with small diameter feeder and distribution lines, pipeline construction, and sewer construction. Major features include a front-mounted power take-off which permits the side boom to work independently of the tractor master clutch and a twin-clutch arrangement on the power take-off. It has a counterweight of 6,500 lb. which may be extended and retracted hydraulically. The boom, which is 15 ft. long, pivots on replaceable hardened pins and bushings. An automatic clutch throwout prevents bending of the boom against the stops. Total width with outer frame members removed is 8 ft. 2 in.

540

Steel dump bodies produced by Hobbs

Hobbs Manufacturing Co. has begun regular production of heavy-duty, steel dump bodies. The shell is of 10-gauge, high-resistance sheet steel and is welded to the understructure to form a one-piece body. Cross members extend beyond the sides of the body shell to support the full-length running boards and vertical V-type side braces. Offset upper hinge allows quick opening of the tailgate to its maximum capacity. Capacity of the body ranges from 1½ to 4 cu. yd.

541

Osgood-General Model 250 for small contracting jobs

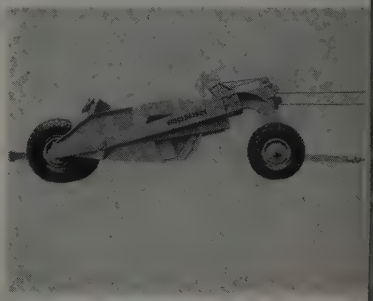
Osgood-General has announced Model 250, a ¾-cu. yd. crawler-mounted machine designed for counties, towns, cities and small contractors. The machinery is mounted on a one-piece cast steel deck. Swing and travel motions are controlled by spiral bevel gears, machine-cut teeth, and air-cooled, band-type clutches. The

shovel boom is a 17-ft.-long, all-steel, welded-box type. There is a lattice-type boom or crane, dragline, and clamshell service at a standard boom length of 35 ft. Inserts 5, 10, 15 and 20-ft. long are also available, as are 2-piece jibs, 10 ft. long with 5 and 10-ft. inserts. Overall length of the crawlers is 11 ft. with standard 22-in.-wide treads. Weight of the machine as shovel and hoe is about 36,000 lb. Specification No. 5420, which contains additional information, is available on request.

542

New Wooldridge line of open-bowl scrapers

A line of four new open-bowl, tractor-drawn scrapers providing a heaped capacity range of 10.5 to 25 cu. yd. has been introduced by **Wooldridge Manufacturing Co.** Features of the line are low center of gravity, high ground clearance, wide apron open-

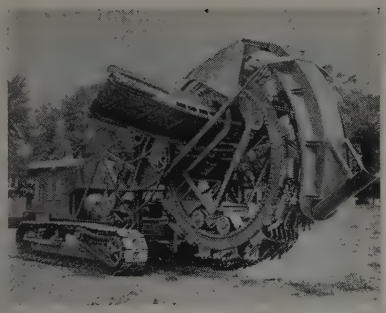


ing, and full-power, forward pivot tilt ejection. The new models are known as OS-80, OS-90, OS-152, and and largest, OS-200. Primary operating advantages are said to include fast loading and dumping with minimum tractive effort, high maneuverability, and simple reeving and long cable life.

543

Gar Wood ditcher designed for pipelines

The Buckeye Model 315, a new pipeline and utility ditcher, has been announced by **Gar Wood Industries Inc.** It was designed to dig to a maximum depth of 6 ft. with cuts varying in width from 24 to 40 in. in steps of 2 in. It has eight digging speeds forward ranging from 1.37 to 20.49 f



per min. It is powered by a heavy-duty diesel engine, 76 hp. at 1,600 rpm. An 80-hp. gasoline engine is optional. The digging wheel comes equipped with 15 standard buckets. Rims are drilled so that 8, 10, 12 or 15 buckets can be used. Flat-bottom buckets are available as optional equipment. Soil can be deposited on either side of the ditch by the shiftable conveyor, which ranges in speed from 225 to 764 ft. per min. The crawlers maintain low ground bearing pressure of 6 psi., which permits the machine to operate over soft soil.

544

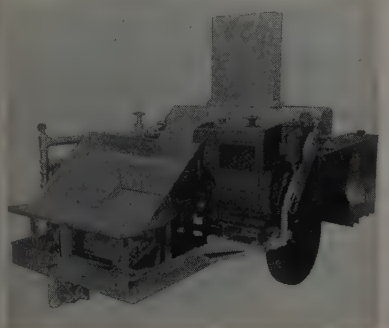
Schield Bantam announces shovel dipper trip

Schield Bantam Co. has announced addition of an electrically-operated shovel dipper trip as optional equipment on its line of truck and crawler-mounted, ⅜-cu. yd. power shovels. The new attachment enables the operator to swing and dump without changing controls. Greater dumping accuracy is obtained by mounting the control switch on the swing clutch level, thus placing the swing and dump operations into one fast cycle. The new trip may also be installed on all previous Bantam models. Information available on request.

545

New HTD-JR asphalt mixer

K. E. McConnaughay announces its new HTD-JR asphalt mixer featuring both hot and cold mixing. The unit will handle 120 tons of cold mix per hr. or 20 tons of hot mix per hr. as a continuous mixer. It is especially recommended as a continuous mixer for production of cold mixtures. The unit has a metal conveyor 24 in. wide for proportioning the aggregate. A

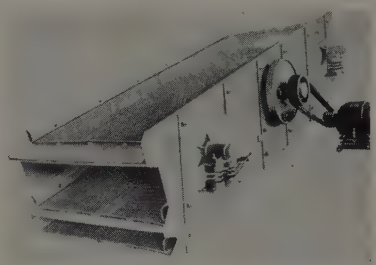


positive displacement pump with a capacity of 55 gpm. provides for proportioning of bituminous material.

546

Screen mounting given self-aligning feature

Bodinson Manufacturing Co. has developed a self-aligning feature on its line of vibrating screens. They are especially adapted for screening rock, sand, and gravel because of their sturdy construction, simple design, and trouble-free service. The screen can be suspended with cables or

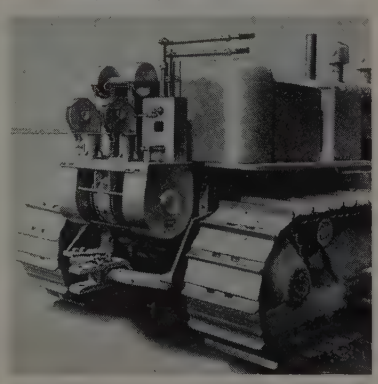


mounted on a frame with an arrangement of springs and supports so that it will align itself on any slope. Available in various sizes, with either one, two, or three decks.

547

New power control unit announced by Gar Wood

A new medium-duty, rear-mounted power control unit, Model 261, has been announced by **Gar Wood Industries, Inc.** It is designed for dozer or scraper work with tractors between 40 and 130 hp. It incorporates planetary type gearing for accurate control and smooth operation. The absence of jerking eliminates excessive



strain on the cable, lengthens cable life, and cuts down operator fatigue. Minimum hand pull is required on the cable drum. Whenever a lever is released, it returns automatically to the neutral position.

A compact fairlead smooths cable accurately on drums in level layers by oscillating instead of sliding sheaves. The fairlead assembly is anti-friction bearing mounted. Band-type clutches and brakes have large surface area for control and heat dissipation. Clutch and brake drums can be removed for overhauling without disassembling the entire unit or removing from the tractor. Line pull for bare drum is 5,000 lb. and for a full drum it is 2,600 lb. The drums handle 268 ft. of ½-in. cable.

548

Gooseneck boom available on Pitman crane

A hydraulically-operated, goosenecking boom is available as optional equipment on the Pitman Crane, Model 80, a 4-ton truck crane manufactured by **Pitman Manufacturing Co.** This new boom enables the operator to fold it down over a loaded trailer and be ready for road travel in a few seconds. It was designed to reduce equipment and man-power costs of handling and hauling pipe, poles, steel, and many other types of material. The goosenecking operation is accomplished with a hydraulic cylinder installed in a V-shaped opening about 4½ ft. from the base of the

boom. This crane has a capacity of 4 tons on a 25-ft. boom, 3 tons on a 37-ft. boom. Additional boom lengths up to 59 ft. are also available.

549

Turbo announces new steam cleaner

Turbo Machine Co. announces manufacture of the Spontane Steam Cleaner. Features include portability, automatic water level and pressure control, and a pre-heating arrangement which makes it possible for the unit to convert cold water to 80 psi. steam in 45 sec. It operates at steam pressures ranging from 80 to 125 psi. Literature available on request.

Tandem-Axle Models . . . With two 7-cubic-yard hoppers. Gate controls are hand, cable, or air-operated, with 10 different settings for gate control pins. Gates can be set up for individual operation.

CAPACITY PLUS!

Fruehauf's New, Low-Cost, Lightweight Hopper-Type Dump Trailer For Sand, Gravel, Cinders, or Bulk Cement

GRAVEL SPREADER—hopper-type dump—lightweight transport for sand, cinders, gravel, soda ash, coal, and bulk cement—these are just a few of the functions of this versatile, high-capacity, new Fruehauf! Construction men, specialized haulers of construction materials, and highway departments are finding it the perfect answer to a great variety of hauling needs.

Extremely low cost, extremely light weight, and extremely high capacity are three of the exceptional advantages of the Fruehauf Hopper-Type Dump. Since there is no heavy lift equipment and only one integral-type frame, a tandem Hopper-Type unit saves you more than 1000 pounds in equipment weight as opposed to a hoist-type dump of comparable length. Initial cost and maintenance expense are also greatly reduced because of the elimination of hoist equipment and extra trussing.

Contact your neighboring Fruehauf Branch today, or write to Fruehauf Trailer Company, 10961 Harper Avenue, Detroit 32, Michigan, for complete specifications, prices, and adaptations of this new Fruehauf to your own special hauling needs!

World's Largest Builder of Truck-Trailers

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FRUEHAUF TRAILERS
"ENGINEERED TRANSPORTATION"

Single-Axle Models . . . With one standard 10-cubic-yard hopper. Gate controls same as tandem unit. Either tandem or single-axle unit can be converted to a bulk cement haul by addition of roof and loading hatches.

553

Water-tight expansion joint

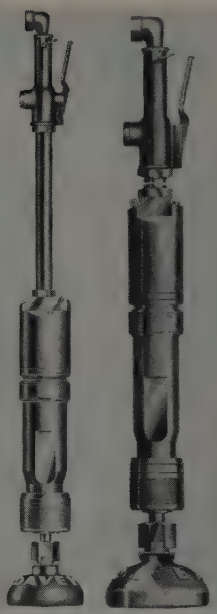
PR-395-HT is a new Thiokol base compound that has been developed by **Products Research Co.** as both a sealer and expansion joint. It has been found particularly useful in concrete repair work and original construction, but is generally recommended for use wherever expansion, contraction, or vibration requires joint resilience by itself or in conjunction with a water seal.

Used with a primer, it achieves an unusually strong bond to most materials. The primer, which has great penetrating qualities, forms a deep, waterproof barrier, and strengthens concrete by increasing the bond of the particles adjacent to the joint. The compound, applied with a spatula or extrusion gun, has a non-sagging consistency and will hold its position on vertical and overhead installations. It has weather resistance and retains its soft, elastic consistency indefinitely. Literature available on request.

554

Backfill tampers announced by Davey

Two new backfill tampers, Models DT-32 and DT-42, have been announced by the **Davey Compressor Co.** Model DT-32 weighs 35 lb. and is 47¼ in. long. Maximum body diameter is 3 in. and butt diameter is 6 in. Model DT-42 was designed to speed up tamping jobs without increasing labor cost. It weighs 45 lb., is 47¼-in. long and has a body maximum diameter of 3¾ in.

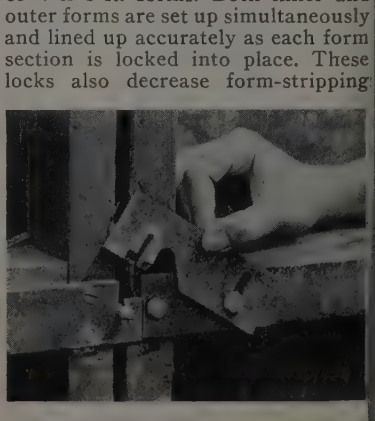


Features of these tampers include a special locked-type butt which keeps the butt from coming off the piston during operation, heavy-duty extension rod, alloy steel hollow butt, and replaceable throttle valve bushings. Both tampers can be frame-mounted to permit operation of three tools simultaneously. Further information available on request.

555

Interlocking hardware cuts form costs

Interlocking hardware, which permits contractors to save from one-third to one-half on concrete form costs according to the manufacturer, has been developed by **Simplex Forms System, Inc.** This interlocking hardware is mounted directly on 2 x 8-ft., or 4 x 8-ft. forms. Both inner and outer forms are set up simultaneously and lined up accurately as each form section is locked into place. These locks also decrease form-stripping

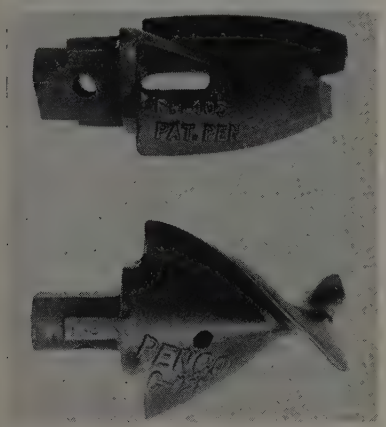


time. They are made of case-hardened steel, guaranteed to withstand high pressure concrete. Form setting speeds up to a foot a minute have been obtained by using this system during field operations. No walers are necessary, since steel bands mounted to the forms serve as walers. Literature is available on request.

556

Auger pilot bits bite through frozen ground

Peterson Engineering Co. announces a new type of Pengo auger pilot bits especially designed for use in frozen ground. These bits, known as Fishtail-Hardpan and Cone, both have narrow fishtails designed to



open a small hole in hard surfaces into which the forward curve moldboards of wedge-shaped design spiral their way, opening the way for the center shaft of the auger. The forward curving of the moldboards and their spiraling position make them self-sharpening. They are so positioned as to deliver spoil to both sides of the auger.

557

Log-loader developed in Northwest

Bow Lake Equipment Co., Inc., has developed a log-loader for the small logger capable of handling logs in the thousand-foot range. It consists of a heavy built under-carriage, International engine and rear end with off-center cab, detachable outriggers, a specially designed heel boom made by Young Iron Works, and the upper

structure is the P & H Model 55 Miti-Mite. This machine can also be used with a backhoe, crane, or shovel attachment. Accompanying photo shows the unit heeling an 1,800-ft. fir log weighing about 8,000 lbs.

558

Ropax is non-porous, sewer-joint packing

Ropax, a new, non-porous, sewer-joint packing, has been developed by **Presstite Engineering Co.** to provide additional sealing material in the joint. It is recommended where adverse soil conditions and excessive ground water are encountered and where low infiltration requirements demand tighter, more dependable joints. It consists of a processed fibrous core, impregnated and saturated with a blend of selected asphalts and containing an inhibitor to prevent the growth of bacteria and fungi. Available in diameters of ⅜ in., ½ in., and 1¼ in., it is furnished on convenient-to-use spools.

559

Roadside mower shears through heavy brush

Worthington Mower Co. has announced its Model 72 rotary designed for use on highways and other places

where mowing heavy, dense growth is a problem. It was designed especially to take maximum advantage of the power take-off output from a 2-plow tractor.. Specifications include a 72-in.-wide cut in which two plates rotate in a horizontal plane at 1,500 rpm. Each spindle of the cutter drive is operated by three multiple V-belts. The machine is easily adjustable for cutting height from ground level up to 10 in. and each wheel may be raised or lowered independently. This mower has a welded frame of heavy plate steel. Literature available on request.

560

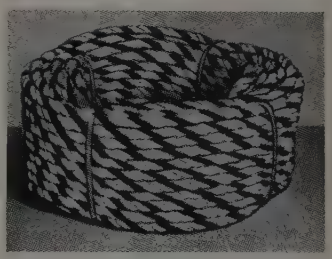
Largest hammer drill yet designed

The Challenger Blasthole Drill, described as the largest hammer yet designed, has been announced by **Joy Manufacturing Co.** It will drill 4½-in.-dia. holes to depths of 50 ft. or more in any type of formation. The drill uses 2-in. round sectional steel with a ¾-in. air hole for blowing action. It is available in three different mountings, the TWM-2, self-propelled by a tractor power unit; TWM-2A, self-propelled by two reversible piston-type air motors; and the TWM-3, comprised of the drill and feed and necessary brackets for mounting on the drill operator's crawler-mounted tractor.

561

Plastic barrier rope

Industrial Products Co. announces a new plastic barrier rope made of triple-strand polyethylene plastic. Two of the strands are yellow and one is black to give the rope high visibility. It is 5/16-in. in diameter and has dielectric properties and no sag or stretch. It will not support combustion, is not affected by oil, and will not absorb dirt, but it is light



and flexible and easy to use and tie in position, the manufacturer says. Recommended for use in barricades around electrical equipment, roping off test areas, and roping off such work areas as street and highway jobs, building projects, and other construction activities.

562

Non-metallic tape

The Lufkin Rule Co. has produced a non-metallic tape designed for longer wear and greater dimensional stability. Markings are protected by coatings of specially compounded plastic to make the tape resistant to abrasion, cracking, mildew, moisture, and temperature changes. The last preceding foot number is repeated in red at each inch. Known as the Hi-Line, this tape has been designed for power, utility, and general work around high-tension circuits. It is recommended wherever a non-conductor is needed. Tape comes in sizes ranging from 25 to 150 ft. Descriptive literature available on request.

563

Worthington announces smooth exterior tampers

Worthington Corp. has announced a newly-designed backfill tamper, known as W-18, and a triplex tamper, known as WT-18. Emphasized features include smooth exteriors free from nuts, bolts, or other projections to interfere with the operator, a lock on the gland nut to keep the front end tight, built-in lubricator, lower air consumption, and low maintenance cost. Specifications include, on the W-18, shipping weight of 37½ lb. standard butt size of 6 in., length of 49½ in., and cylinder bore of 1½ in. WT-18 Triplex tamper weighs 132 lb., is 32 in. long, and stands 34 in. high. It has a compaction area of 85 sq. in. Free descriptive bulletin available on request.

564

Electronic pipe finder

An electronic pipe finder for locating and tracing buried pipes, conduits, and metal objects has been announced by **Fisher Research Laboratory.** The new circuit, which elimin-

ates multiturn antenna loops, is less sensitive to temperature changes and all types of outside interference. Reduced current consumption increases the time between battery changes.

565

Radio signal indicates level of stored material

An electronic signal device has been developed by **Hewitt-Robbins, Inc.** to prevent accidental overfilling or emptying of bins, tanks, and other storage units. Called the Robintronic Level Indicator, it uses a radio signal to indicate and control the level of stored material. It is recommended for use in handling sand, gravel, and other bulk material. It consists of a small radio transmitter housed in a steel probe which is placed where the material flow control is wanted. When the probe is exposed, the broadcast signal actuates automatic controls which start or stop the material flow.

566

McCulloch chain saw

McCulloch Motors Corp. has announced a two-man chain saw, designated Model 99. Features of the new model are a bigger fuel tank, longer lasting connecting rod bearing, heavy-duty clutch rotor, and stronger handle bars with cylinder fin and exhaust guard. Its internal balancing has been improved to take vibration out of cutting and make the saw more comfortable to operate.

UNIT PRICES

Selected abstracts for Western projects

BRIDGE—Undercrossing and approaches in Washington

Washington—Lewis County—State. Pokor Construction Co. of Chehalis was awarded a contract to build an undercrossing and approaches at the intersection of State Highways 1 and 12 on a low bid of $162,894. Unit prices were as follows:

(1) Pokor Construction Co.	$162,894
(2) Troy T. Burham Co.	173,167
Peter Kiewit Sons' Co.	176,232
David Nygren	177,956

		(1)	(2)
1	acre clearing	100.00	50.00
1	acre grubbing	100.00	50.00
Lump sum,	clearing and grubbing	—	—
290	cu. yd. common excavation including haul	.65	1.15
1,390	cu. yd. common trench excavation including haul	.75	1.15
59,190	cu. yd. common borrow including haul	.55	.74
1,160	cu. yd. structure excavation	3.25	2.00
18	days smooth-wheeled power roller	50.00	60.00
18	days tamping roller	60 00	46.00
36	days pneumatic-tired roller	50.00	55.00
24	days mechanical tamper	70.00	57.50
19	stas. (100-ft.) finishing roadway	8.00	18.50
250	M. gal. water	2.50	2.25
60	cu. yd. gravel backfill for foundations	5.00	3.00
2,640	ton furnish. and plac. cr. stone surf. top course	2.55	2.50
6,400	ton furnishing and placing ballast	2.50	2.25
	TYPE I-1 ASPHALTIC CONCRETE PAVEMENT		
10	ton asphalt cement MC-3 prime coat	60.00	60.00
1,126	ton Class C wearing course	10.00	10.00
541	ton Class L leveling course	10.00	10.00
	OTHER ITEMS		
124	lin. ft. std. reinf. conc. culv. pipe 36-in. diam.	12 00	11.00
66	lin. ft. conc. sewer pipe 12-in. diam.	2.45	3.00
12	lin. ft. conc. sewer pipe 21-in. diam.	10.00	10.00
120	lin. ft. bit. coat. cor. met. culv. pipe, #16 ga., 8-in. diam., Type #2	3.00	3.50
168	lin. ft. relaying plain conc. sewer pipe, 12-in. diam.	2.50	3.00
168	lin. ft. relaying plain conc. sewer pipe 21-in. diam.	7.00	3.00
150	lin. ft. beam guard rail	4.00	4.00
5	only reinforced conc. right of way markers	9.00	7.50
38	only reinforced conc. spot posts	14.00	12.50
6	cu. yd. hand placed riprap	40.00	20.00
5	only adjusting manholes to grade	40.00	40.00
250	sq. yd. removing cement concrete pavement	1.00	1.00
35	sq. yd. removing cement concrete sidewalk	1.00	1.00
240	lin. ft. removing temporary beam guard rail	1.00	1.00
Lump sum,	removing timber bridge	—	—
80	lin. ft. resetting temporary beam guard rail	3.00	1.50
	BRIDGE		
220	cu. yd. structure excavation	4.00	3.00
360	cu. yd. concrete Class A	70.00	75.00
70	cu. yd. concrete Class B	50.00	75.00
339	lin. ft. reinforced conc. bridge railing	8.00	10.00
115,000	lb. steel reinforcing bars	.105	.12
3	only bridge drains complete in place	70.00	100.00
3,600	lin. ft. furnishing concrete piling	4.00	4.00
90	only driving conc. piles first 10 ft.	55.00	72.00
2,655	lin. ft. driving conc. piles over 1st 10 ft.	.10	.10
3	only furnishing and driving conc. test piles	600.00	700.00

CANAL—Construction of 800 ft. of St. Vrain Supply Canal in Colorado

Colorado—Colorado-Big Thompson Project—USBR. Colorado Constructors, Inc., Denver, submitted a low bid of $52,240 for excavation, concrete canal lining, and riprap on 800 ft. of the St. Vrain Supply Canal. Unit prices were as follows:

(1) Colorado Constructors, Inc.	$52,240
(2) Peter Kiewit Sons' Co.	53,145
John P. Gardner	53,315
Cass Company—Contractors	54,580
Stephenson Logging and Construction Co.	57,156
L. J. Hesser	57,385
M. C. Jacobs Construction Co.	57,478
K. S. Mittry Construction Co.	67,670
Burks and Co.	71,710
Winston Bros. Co.	97,440

		(1)	(2)
40,000	cu. yd. excavation, first 40,000 cu. yd.	.60	.45
30,000	cu. yd. excavation, over 40,000 cu. yd.	.50	.40
1,080	sq. yd. preparing foundations for conc. canal lining	2.00	2.00
2,400	cu. yd. placing earth lining	.40	3.00
2,400	cu. yd. compacting earth lining	.40	.75
400	cu. yd. fill at top of conc. and earth canal lining	.75	1.00
210	cu. yd. riprap	5.00	6.00
60	cu. yd. gravel bedding for riprap	3.00	2.25
83	cu. yd. concrete in unreinf.-conc. canal lining	45.00	60.00
43	cu. yd. concrete in reinf.-conc. canal lining	50.00	70.00
170	bbl. furnishing and handling cement	6.00	5.50
4,500	lb. furnishing and placing reinforcement bars	.15	.17
Lump sum,	disposal of aggregate stock piles	90.00	100.00

HIGHWAY—Bituminous surfacing and a concrete bridge in Utah

Utah—Uintah County—State. L. A. Young Construction Co. of Richfield submitted a low bid of $121,922 for placing a 2-in. road-mixed bituminous surface on 2.9 mi. of State 49 and building a 39-ft. concrete bridge. Unit prices were as follows:

(1) L. A. Young Construction Co.	$121,922
(2) Miya Brothers and K. C. Construction Co.	123,582
Wheelwright Construction Co.	125,313
W. W. Clyde & Co.	130,491
Ross Construction Co.	131,052
Vernal Sand and Gravel Co.	133,266
Peter Kiewit Sons' Co.	139,560
Reynolds Construction Co.	150,255

		(1)	(2)
56,000	gal. bituminous material, Type MC-3	.16	.13
14,500	gal. bituminous material, Type MC-1 or MC-2	.18	.13
5,000	gal. bituminous material, Type RC-1 or RC-2	.18	.13
16,000	ton gravel surface, Type "B"	.65	.70
15,000	ton gravel surface, Type "A" stockpiled	.50	.55
2,500	ton gravel surface, ½-in. maximum, stockpiled	.85	.75
2,500	ton cover material, Type "A" in stockpile	1.80	2.00
13,000	cu. yd. selected material base course	.40	.55
2.948	mi. scarifying and mixing	700.00	650.00
46,000	cu. yd. unclassified roadway excavation	.23	.25
4,100	cu. yd. imported borrow	.23	.30
165,000	sta. yd. class "A" overhaul	.01	.01
15,000	yd. mi. class "B" overhaul	.12	.15
1,500	1,000-gal. watering	1.00	1.40
400	hr. rolling, tamping roller	8.00	8.00
100	hr. rolling, pneumatic tire or power roller	5.00	7.00
220	hr. 15-in. bitum. protected C.M. pipe prot. Type "A"	3.00	3.00
136	lin. ft. 18-in. bitum. protected C.M. pipe Type "A"	5.00	4.35
80	lin. ft. bit. prot. C.M.P. arches, 22-in. x 13-in. prot. Type "A"	6.00	4.70
44	lin. ft. bit. prot. C.M.P. arches 29-in. x 18-in. prot. Type "A"	8.00	6.30
50	lin. ft. bit. prot. C.M.P. arches 36-in. x 22-in. prot. Type "A"	10.00	7.25
60	lin. ft. bit. prot. C.M.P. arches 82-in. x 44-in. prot. Type "A"	30.00	22.00
250	lin. ft. 15-in. spec. alk. res. pipe (Type "A" if CMP is used)	4.00	3.60
130	lin. ft. 18-in. spec. alk. res. pipe (Type "A" if CMP is used)	6.00	4.50
58	lin. ft. 36-in. spec. alk. res. pipe (Type "A" if CMP is used)	15.00	12.25
164	lin. ft. CMP arches 22-in. x 13-in. spec. alk. res. pipe Type "A"	6.00	5.25
130	lin. ft. CMP arches 29-in. x 18-in. spec. alk. res. pipe Type "A"	7.00	7.25
62	lin. ft. CMP arches 50-in. x 31-in. spec. alk. res. pipe Type "A"	20.00	14.50
66	lin ft. CMP arches 72-in. x 44-in. spec. alk. res. pipe Type "A"	30.00	27.00
500	lin. ft. 8-in. underdrains	2.00	1.90
60	cu. yd. granular backfill	3.00	.75
20	cu. yd. hand placed riprap	20.00	12.00
22	cu. yd. concrete class "B"	30.00	58.00
2,000	cu. yd. excav. for structs., unclassified	1.50	1.50
1,400	cu. yd. small ditch excavation	.40	.60
70	hr. mechanical tamping	4.00	4.00
6	cu. yd. concrete, class "A"	30.00	61.00
700	lb. reinforcing steel	.20	.15
350	lb. structural steel	1.00	.25
9,200	lin. ft. right-of-way fence, Type "B"	.30	.35
10	ea. 14-ft. gates	30.00	30.00
63	ea. guide posts	7.00	6.00
2	ea. removal of trees	50.00	100.00
2	F.A.P. markers	30.00	25.50
40	ea. right-of-way markers	10.00	5.50
Lump sum,	furn. water equipment	400.00	600.00
Lump sum,	furn. construction signs	300.00	250.00
	(1) Conc. bridge over 20-ft. span		
260	cu. yd. excav. for structs, unclassified	5.00	1.00
255	cu. yd. concrete, class "A"	60.00	58.00
36,800	lb. reinforcing steel	.13	.135
75	lin. ft. steel handrail	14.00	15.00
1,330	lin. ft. piles (other than timber)	7.00	7.84
Lump sum,	furn. pile driving equipment	$2,000	$1,500

BRIDGE—A 385½-ft. steel and concrete railroad overpass in Montana

Montana—Broadwater County—State. F. L. Flynn & Co. of Billings was awarded a contract to build a 385½-ft. steel and concrete overpass over NP Railway Co. tracks on the basis of a low bid of $149,941. Unit prices were as follows:

(1) F. L. Flynn & Co.	$149,941
(2) COP Construction Co.	159,167
Montana Engineering & Construction Co.	163,277
Schye & Sullivan	163,858
Holm Construction Co.	168,705
McLaughlin Construction Co.	170,594
Haggerty-Messmer Co.	174,641
Riedesel Construction Co.	175,004
Hansen & Parr Construction Co.	179,156

		(1)	(2)
219,548	lb. structural steel	.219	.23
149,872	lb. reinforcing steel	.15	.165
391.0	cu. yd. Class A concrete	60.00	70.00
532.8	cu. yd. Class AD concrete	80.00	76.00
768.0	lin. ft. steel bridge rail	9.50	10.00
1,200	cu. yd. structure excavation	5.00	7.00

MISCELLANEOUS—Steel tetrahedron bank protection on the Santa Ynez River

California—Santa Barbara County—State. Vic Martin of Pasadena submitted a low bid of $10,326 for construction of steel tetrahedron bank protection on the Santa Ynez River near Lompoc. Unit prices were as follows:

(1) Vic Martin	$10,326
(2) Hermreck & Easter Contractors	13,390
R. R. Hensler	15,510
Stanley H. Koller Construction Co.	15,682
D. D. Galbraith and Robert F. Batty	15,778
Albert S. Pratt, Jr.	16,630

	(1)	(2)
18 ea. steel rail tetrahedrons	457.00	625.00
6 ea. concrete anchor blocks	100.00	190.00
5000 lin ft. 1-in. steel cable	.30	.20

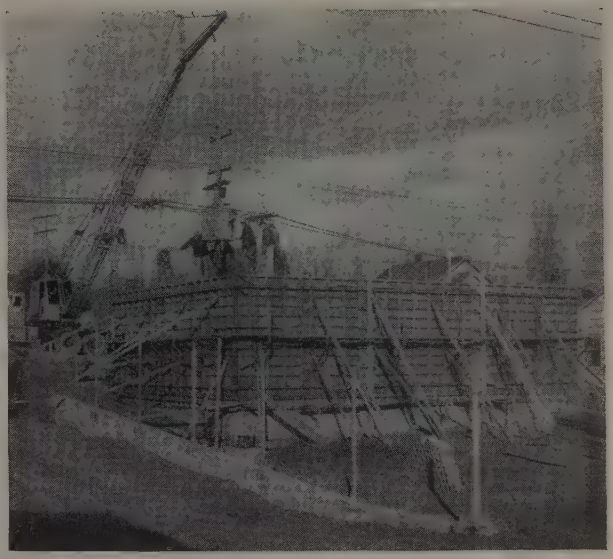
SEWERAGE—Vitrified clay pipe sewer outfall line for La Habra Sanitary District

California—Orange County—La Habra Sanitary District. M. G. R. Construction Co. of Los Angeles was low bidder on both Alternate 1 ($64,830) and Alternate 2 ($67,066) for installation of vitrified clay pipe line sewer. Unit prices were as follows:

	Alternate 1	Alternate 2
(1) M. G. R. Construction Co.	$64,830	$67,066
A. H. Famularo	77,713	79,111
Chas. L. Burch & Son	88,696	94,421
J. S. Barrett	89,083	91,315
James I. Gallacher	95,449	100,434
Bosko and Bradarich	73,707	
Paul Vukich Construction Co.	69,685	75,722
Heisler & Woods	82,868	84,968
Chutuk & Kaufman	74,361	81,196
Izzi Construction Co.	95,799	99,231
Milosovich & Zarubica Construction Co.	77,854	82,116
Angelo Rossi Construction Co.	74,905	76,339
Nick M. Guho	71,029	74,068
J. E. Popovich	89,960	91,025
George Dakovitch	86,371	88,502
S. S. Zarubica	76,059	
A.B.C. Construction Co., Inc.	86,071	87,711

	(1)
1,006 lin. ft. of 15-in. vitrified clay pipe	4.25
3,409 lin. ft. of 18-in. vitrified clay pipe	5.50
45 lin. ft. of 18-in. vitrified clay pipe in casing	36.00
4,110 lin. ft. of 21-in. vitrified clay pipe	8.50
17 standard manholes	250.00
400 tons of crushed rock	2.50

Continued on page 146



First of four rectifier buildings for City Light, Seattle. C & R Builders, Seattle and Alaska, Gen. Con.

UNIT PRICES ... CONTINUED

HIGHWAY—Grading, paving, and miscellaneous structures in California

California—Los Angeles County—State. J. E. Haddock, Ltd. of Pasadena, submitted a low bid of $3,135,122 for 1.4 mi. of grading and PCC paving on an eight-lane, divided section of the Harbor Freeway in Los Angeles. Miscellaneous structures to be built include 11 retaining walls, a pumping plant, 3 pedestrian undercrossings, 10 bridges, and ramps, frontage roadways, and interchange lanes. Unit prices were as follows:

(1) J. E. Haddock, Ltd. $3,135,122
(2) B. J. Ukropina, T. P. Polich, Steve Kral, & John R. Ukropina 3,167,718
Webb & White 3,173,195
J. A. Thompson & Son 3,215,094
Oberg Bros. Construction Co. 3,227,698
Vinnell Company, Inc. and subsidiaries Vinnell Constructors 3,235,855
Guy F. Atkinson Co. 3,241,258
Griffith Co. 3,438,303

		(1)	(2)
4,275	cu. yd. removing concrete	4.00	3.00
Lump sum,	clearing and grubbing	$54,000	$40,000
553,700	cu. yd. roadway excav.	.38	.33
11,000,000	sta. yd. overhaul	.004	.005
27,950	cu. yd. struct. excav.	1.50	2.00
17,200	cu. yd. struct. backfill (bridge)	2.00	1.50
13,000	sq. yd. compact. original ground	.03	.05
5,200	topsoil	.40	.30
16,000	sq. yd. preparing slopes (erosion control)	.06	.10
Lump sum,	dev. wat. sup. and furn. wat. equip.	$25,000	$24,000
21,800	M. gal. applying water	1.00	1.20
Lump sum,	finishing roadway	$1,500	$3,000
100,000	sq. yd. mix., spread. and compact. (C.T.S. & C.T.B.)	.20	.24
4,000	bbl. portland cement (C.T.S. & C.T.B.)	3.70	3.90
55	ton asph. emul. (cur. sl., pt. bdr., & sl. ct.)	35.00	30.00
80	ton liquid asph., MC-2 (cur. sl.)	37.00	30.00
20	ton liquid asph., SC-2 (pr. ct.)	34.00	30.00
14,437	ton mineral aggr. (Type "A" P.M.S.)	5.00	5.00
3,000	ton mineral aggr. (Type "B" P.M.S.)	5.50	5.60
923	ton pav. asph. (P.M.S.)	5.00	5.00
9,000	placing P.M.S. (curbs)	.25	.20
20,500	cu. yd. Cl. "B" P.C.C. (pavement and base)	13.00	13.50
17,000	ea. pavement tie bolt assemblies	.65	.90
25,035	cu. yd. Cl. "A" P.C.C. (struct.)	45.00	45.00
4,610	lin. ft. rubber waterstops	1.80	1.50
100,900	lb. miscl. iron and steel	.28	.25
24,550	furn. concrete piling	2.00	2.50
987	ea. driving concrete piles	60.00	50.00
1,750	lin. ft. furn. steel piling	3.25	2.90
29	ea. driving steel piles	150.00	50.00
4	ea. steel pile splices	30.00	25.00
4,884	cu. yd. Cl. "B" P.C.C. (curbs, gutters and sdwlk.)	24.00	28.00
420	lin. ft. curb armor	3.50	3.35
9,000	lin. ft. metal plate guard rail	2.60	2.75
1,250	salv. and reconst. met. plate guard rail	2.00	1.75
1,100	lin. ft. 48-in. chain link fence (rail top)	1.25	1.20
2,000	lin. ft. 60-in. chain link fence (rail top)	1.40	1.45
14,000	lin. ft. 72-in. chain link fence (rail top)	1.70	1.91
950	lin. ft. salv. and reconst. chain link fence	1.00	.70
1	ea. 10-ft. drive gate	100.00	80.00
26	ea. walk gates	60.00	70.00
3,967	lin. ft. 28-in. steel railing	7.00	6.70
284	cu. yd. filter material	6.00	4.00
4,501,000	lb. bar reinf. steel	.094	.085
150	lin. ft. 18-in. R.C.P. (std. str.)	3.00	3.00
150	lin. ft. 15-in. R.C.P. (std. str.)	3.60	5.00
1,200	lin. ft. 18-in. R.C.P. (std. str.)	4.30	6.00
32	lin. ft. 18-in. R.C.P. (2250-D)	4.50	6.50
65	lin. ft. 21-in. R.C.P. (std. str.)	5.20	7.00
2,450	lin. ft. 24-in. R.C.P. (std. str.)	5.60	9.00
310	lin. ft. 27-in. R.C.P. (std. str.)	7.20	10.00
60	lin. ft. 33-in. R.C.P. (std. str.)	7.40	11.00
1,200	lin. ft. 36-in. R.C.P. (std. str.)	9.00	12.50
75	lin. ft. 39-in. R.C.P. (std. str.)	10.60	15.00
235	lin. ft. 42-in. R.C.P. (std. str.)	11.60	16.00
320	lin. ft. 48-in. R.C.P. (std str.)	14.00	20.00
185	lin. ft. 48-in. R.C.P. (1350-D)	14.10	21.00
330	lin. ft. 51-in. R.C.P. (std. str.)	15.00	25.00
175	lin. ft. 51-in. R.C.P. (1350-D)	15.60	26.00
375	lin. ft. 54-in. R.C.P. (std. str.)	16.40	30.00
194	lin. ft. placing 48-in. R.C.P. (state-furn.)	5.00	5.00
725	cu. yd. Cl. "C" P.C.C. (pipe reinforcement)	24.00	20.00
75	lin. ft. 6-in. vitr. clay sewer pipe (std. str.)	5.00	8.00
675	lin. ft. 8-in. vitr. clay sewer pipe (std. str.)	6.00	9.00
1,400	lin. ft. 8-in. vitr. clay sewer pipe (extra str.)	6.50	10.00
350	lin. ft. 10-in. vitr. clay sewer pipe (std. str.)	7.00	12.00
6	ea. manholes (sanitary sewers)	260.00	400.00
1	ea. drop manhole (sanitary sewers)	400.00	400.00
3	ea. junction chambers "F" (sanitary sewers)	300.00	500.00
1	ea. junction chambers "G" (sanitary sewers)	300.00	500.00
5	ea. remodel. sanitary sewer manholes	175.00	200.00
50	lin. ft. pipe shaft manholes (storm drains)	20.00	30.00
70	lin. ft. 1½-in. galv. steel pipe (sprinkl. sys.)	.90	2.00
510	lin. ft. 2-in. galv. steel pipe (sprinkl. sys.)	1.15	2.50
800	lin. ft. 2½-in. galv. steel pipe (sprinkl. sys.)	2.00	3.00
1,502	lin. ft. 4-in. asbestos cement pipe	.70	1.50

News of DISTRIBUTORS

I-H acquires Heil tractor patents

An announcement made jointly by Joseph F. Heil, president of The Heil Co., and Harold T. Reishus, vice president, International Harvester Co., and executive head of I-H industrial power division, discloses an agreement between the two companies which will enable Harvester eventually to manufacture Heiliner 2-wheel, rubber-tired industrial tractors with scrapers and bottom dump wagons for use in heavy construction work. Harvester has acquired the Heil patents covering 2-wheel tractors, but for the time being Heil will build these machines.

General Electric retires West

George S. West, manager of the Construction Materials Division of General Electric Co., San Francisco, recently retired under the terms of GE's pension program after more than forty years of service with the company.

"Duke" Duecker appointed Kyle sales mgr. at L. A.

W. J. (Duke) Duecker has been appointed manager of sales for the Kyle Steel Division of Kyle & Company at Los Angeles, according to an announcement by president Willis B. Kyle. He will handle the sales program in the Southern California

W. J. "Duke" Duecker, **Manager of Sales for Kyle & Company**

area, and will be located in the Los Angeles offices and plant maintained by the Fresno steel products firm at 5200 Alcoa Ave. Prior to accepting this new position, Duecker had been vice president and general manager of the Koehring Company of California.

Republic Supply named "Penflex" distributor

The recent appointment of Republic Supply Co. of California as exclusive California distributor for "Penflex" flexible metallic tubing adds an important line of piping products to Republic's heavy industry and petroleum industry supplies. According to general sales manager, W. D. Russell, the Penflex line fills the gap between metal pipe and rubber hose for many needs. The Pennsylvania Flexible Metallic Tubing Co. has hitherto distributed its products through branch offices, but under the new agency, the manufacturer's district manager, C. F. Taylor, will maintain offices at the Los Angeles main headquarters of the Republic Supply Co.

E. T. Wilson, Jr., dies

E. T. Wilson, Jr., 48, sales representative of the Tubular Products Division of The Babcock & Wilcox Co., died unexpectedly in Portland, Ore., on Feb. 24. He was B&W's representative for Oregon, Washington, British Columbia, as well as the Alberta and Saskatchewan area.

Alloy Rods open new plant

Alloy Rods Co.'s new Pacific Coast Division manufacturing plant at El Segundo, Calif. was formally dedicated Feb. 18. This is said to be the first electrode plant in the West that will produce a complete line of alloy arc welding electrodes. George M. Hohmann is manager of the new plant which has been designed to serve Alloy Rods distributors in the eleven Western states.

Stuart K. Oliver joins Rawlins Bros.

Stuart K. Oliver is the new sales manager of Rawlins Brothers Division of Solar Steel Corp. He will headquarter at the Solar plant in Los Angeles. Oliver has been closely associated with manufacturers of Southern California for the past six years, as an advisor on metallurgical problems and in sales work.

New Howe-Simpson dealership

West Pacific Sales Co. of Portland and Seattle has been appointed dealer for new portable abrasive drills manufactured by Howe-Simpson Co. According to Kenneth L. Tamiesie, president of West Pacific Sales, the drill is currently available on rental basis at both the Portland and Seattle branches of the company.

New Goodall Northwest mgr.

Herbert Cleaver was recently appointed by Goodall Rubber Co., Inc., as Seattle branch manager, succeeding Joe H. Moss, who moved to Chicago to become regional sales director there. A graduate in engineering from the University of Washington, Cleaver is an experienced rubber man, with a wide knowledge of the industry in the Pacific Northwest.

Farmer named West Coast plant mgr.

Appointment of Edward H. Farmer, Los Angeles, to head E. W. Bliss Co.'s new Pacific Coast manufacturing plant was recently announced by Howard U. Herrick, president. Former vice president, manufacturing, for Pacific Airmotive Corp., Farmer, recently resigned to accept this new post with Bliss.

Northwest outlet

According to a recent announcement by Howard-Cooper Corp., Portland, Ore., this company has taken over distributorship of the "Payloader" line of Frank G. Hough Co. for the territory of western Washington and Oregon. Complete sales engineering and service facilities for the heavy-duty tractor-shovel line will be available through all branches of Howard-Cooper.

Braun now distributes Coles cranes

Coles Cranes, Inc., manufacturer of mobile industrial cranes for 75 years, has appointed The Robert H. Braun Co., Los Angeles, as distributor for Southern California and Arizona. Braun is well known as a pioneer dealer in the Southwest area.

Hyster appoints new truck dealer

Appointment of Cashman GMC Truck Co. of Las Vegas, Nev., as dealer in industrial truck equipment manufactured by the Hyster Com-

GRAND OPENING of the new Brown-Bevis-Industrial Equipment Company building at 6550 East Washington Blvd., Los Angeles, was held April 16 and 17.

pany has been announced. The well known Las Vegas firm, managed by James Cashman, Jr., received the exclusive sales rights for the counties of Nye, Lincoln, Esmeralda and Clark in the state of Nevada.

Aero-Coupling expansion

To provide better and faster service to West Coast customers, Aero-Coupling Corp., Burbank, Calif., a subsidiary of Aeroquip Corporation, has increased its plant capacity by a 5,400-sq. ft. addition. The company supplies Aeroquip flexible hose lines, self-sealing couplings, Breakaway couplings and brazed aluminum elbows for construction equipment, as well as for aircraft, industrial automotive and farm applications.

Kaiser Steel news

Kaiser Steel Corp. has established a sales office in Denver, Colo., with Paul B. Kluthe as representative. He will occupy temporary offices in the Mercantile Bldg., 1031 Fifteenth St., until permanent offices are completed.

Other Kaiser news involves the appointment of A. L. Peake, Jr., as assistant sales manager of the Southern district, Los Angeles, and A. G. Grey, as assistant sales manager, Central district, Oakland. Also appointment of J. H. Webber as assistant manager of tubular products sales at the Oakland general offices, and T. H. Wakeman as district sales manager at Tulsa, Okla.

Galion names Southwestern sales mgr.

Appointment of Edward R. Curry as Southwestern regional sales manager of The Galion Allsteel Body Co., is announced by Oliver C. Henkel, president. In his new post, Curry will direct sales of Galion Allsteel dump bodies and hoists of 3 to 27-ton capacities and LOAD-evator rear end loaders. He will make his headquarters in Tulsa, Okla.

Acme Steel promotes three

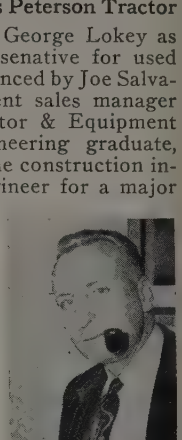
Herbert F. Middleton has been named Western area manager of Acme Steel Products Division of Acme Steel Co., with headquarters in Los Angeles. Formerly district sales manager at San Francisco, he replaces Squire J. Johnson, who left the position recently to assume responsibilities with the parent company. William H. Smythe, Jr., replaces Middleton at San Francisco, and Charles G. Moreau moves up as special representative, replacing Smythe.

David Byrd appointed Gar Wood sales mgr.

Gar Wood Industries, Inc. announces the appointment of David Byrd as sales manager of its Richmond, Calif., division, which manufactures a complete line of dump bodies and hoists, including special side dump and hopper bodies, as well as agricultural scrapers and dozers. He was formerly assistant sales manager of Gar Wood's Wayne division.

George Lokey joins Peterson Tractor

Appointment of George Lokey as special sales represenative for used equipment is announced by Joe Salvador, used equipment sales manager for Peterson Tractor & Equipment Co. A civil engineering graduate, Lokey started in the construction industry as field engineer for a major



George Lokey, **Sales representative for Peterson Tractor**

equipment manufacturer. During World War II he served with the Marine Corps, joining his father in the contracting business at the close of the war. He will make his headquarters at the Peterson main office at San Leandro, Calif.

Link-Belt ups Donald Thal

Link-Belt Co. announces the appointment of Donald E. Thal as central general manager of its Pacific Division, with headquarters at the San Francisco plant, where he has been serving as sales manager. He is now responsible for general management of the Link-Belt San Francisco plant and for sales in the central area of the Pacific Division. Thal joined Link-Belt in 1936 and has since worked in the engineering departments of the Chicago, Seattle and San Francisco plants.

Bay area appointment

Western Traction Co. of San Francisco has been appointed distributor for Seaman Motors Co., covering the counties bordering on the Bay, as well as the peninsular territory south of San Francisco. Besides the newly-acquired Seaman line of mixers, pulverizers and soil stabilizers, Western Traction Co. carries such lines as Chicago Pneumatic Tool Co., Cleaver-Brooks Co., Galion Iron Works & Mfg. Co., Marmon-Herrington Co., Inc., Standard Steel Works, and others.

Personnel changes in So. Pac. Milling Co.

Milton F. Masters, specialist in highway construction engineering, has been appointed executive assistant to the president of Southern Pacific Milling Co., a pioneer California

building materials concern, operating 13 plants producing a variety of aggregates and allied building materials.

Also recently announced is the naming of Eddie Ludwick as general manager of the firm's aggregates operations at the Paso Robles plant, and the advancement of Gordon Tucker to a corresponding position at Santa Maria. There will be no change in personnel at either plant. Ross Knoeppel remains manager of the Paso Robles rock plant and O. E. Wright of the concrete plant; and Clarence Bolter, rock plant superintendent; Al Davis, asphalt plant chief; and Lou Grimes, in charge of the batch plant, in the Santa Maria area.

Safety equipment manufacturer opens Western sales office

Pennsylvania Optical Co., manufacturer of a line of safety and welding equipment under the Penoptic trade-mark, announces the opening of a Western division office and warehouse at 1712 Taraval St., San Francisco, to serve customers in the 11 Western states. Donald H. Long is named division branch manager; Gordon E. Hadley, Southern California representative with headquarters in Los Angeles; and J. Robert Hottel is Northern California representative working out of the San Francisco office.

Nelson Stud Welding appoints new dealer

Announcement of the appointment of Service Electric Supply Co., San Jose, Calif., as authorized dealer to handle Remington stud drivers and studs, is made by Nelson Stud Welding Division of Gregory Industries, Inc., The Nelson firm was recently named national distributor for the powder-actuated tools manufactured by Remington Arms Co., a division of duPont.

MANUFACTURERS

Weather Trends, Inc.

A new corporation, Weather Trends, Inc., has been established in New York to provide long-range weather services for construction, industrial, agricultural and other fields where weather information is necessary to planning. Barry Schilit, meteorologist, is vice president in charge of operations.

Industrial Asphalt news

Industrial Asphalt of Los Angeles has added a Claremont, Calif., location at a cost of about $225,000. This is in line with the company's policy of providing the best service to the industry. The new installation was

Continued on page 150

purchased from Tom Moore, who has been active in the industry for the past fifty years. The addition of Industrial Asphalt at Claremont brings the total number of Standard Steel Corp.'s asphalt plants to seven. An eighth one will go into service at the Claremont site very shortly. All eight Standard plants owned by Industrial Asphalt are designed to furnish asphaltic mixes said to meet any and all specifications. Locations now include the Sun Valley installation under the management of Frank S. McGinnis, the Irwindale plant with J. Ray Brown as manager, and Industrial Asphalt of Claremont with Jim LeSage as manager.

Kaiser promotion

Edward A. Parker was recently made superintendent of the plate and 86-in. hot strip mills at Fontana plant of Kaiser Steel Corp. He was previously assistant superintendent and moves up to the spot formerly held by Joseph E. Macorey who is assuming new duties at the plant.

Osgood-General news

The Osgood Company, manufacturer of power cranes and excavators, announces the purchase of the capital stock of The General Excavator Co. The consolidation began in 1950 with the combining of the sales divisions of the two companies and with the unification of field-service operations in 1952, and the marketing of their products under the name "Osgood-General." Edgar W. Barnhart, formerly vice president and general manager of the General company, has been elected vice president and secretary of Osgood, whose other officers are Robert C. Owens, president; Ben T. Wiant, vice president and treasurer; Edgar W. Barnhart, vice president and secretary, and John F. Lacey, vice president for foundry operations.

Seymour new Atlas prexy

Dr. Raymond B. Seymour is appointed president of Atlas Mineral Products Co., according to recent announcement by George L. Wirtz, chairman of the board. Seymour, the originator of furan cements and other products of the Atlas line, joined the firm as chief chemist in 1939. Since 1945, he has been executive vice president and a member of the board of directors.

Engineer appointments

Appointment of George Davis and Lowell Conrad as chief engineers of the Construction Machinery Division of Clark Equipment Co. is announced. Products of this division include power showels, cranes and draglines formerly manufactured by Michigan Power Shovel Co., and a recently introduced line of tractor shovels. Davis will be concerned with the power shovel line, and Conrad with the tractor shovel.

Robert Hughes heads sales at Willamette Iron & Steel

The appointment of Robert A. Hughes to the position of sales manager of Willamette Iron & Steel Co., heavy plate and machine shop fabricators, Portland, Ore., is announced by Philip F. Thayer, general manager. Hughes had been equipment sales

Robert A. Hughes, **Sales manager for Willamette Iron & Steel Co.**

manager of the Guy F. Atkinson Co., South San Francisco, Calif., before accepting this new position in January. Prior to his association with Atkinson he had been president and general manager of Standard Machinery Co. of San Francisco.

Appointment at E. D. Bullard Co.

R. C. Mills, treasurer and purchasing agent of the E. D. Bullard Co., San Francisco, manufacturer of industrial safety equipment, announces the appointment of R. Phillips Barker as office manager and assistant purchasing agent of the company.

Christerson heads Western Wood-Preserving

New president of the Western Wood-Preserving Operators' association is Paul D. Christerson, Pope & Talbot, Inc., Portland, Ore. Organized in 1947 to deal with industry problems, the association is composed of all major commercial wood-preserving companies with pressure treating plants located west of the Rocky Mountains.

Skookum partnership

J. B. Koeneke, president of the Skookum Co., Inc., Portland, Ore., announces that Phil A. D. Hobbs is joining him as partner in the manufacturing of construction and logging blocks and forgings. Hobbs will serve as the new chief executive, succeeding to the administrative duties of the late Fred Fortier. Koeneke will devote all of his attention to the engineering and production end of the business, with his son, Don Koeneke, acting as plant superintendent.

Waldrip appoints

William S. Sprague, president of Waldrip Engineering Co., announces the appointment of Dr. Joseph Remenyi as chief design engineer. He is a specialist in highly stressed parts for heavy equipment, having devoted a great deal of his attention to the ore crushing industries, in Europe, where he holds many patents on various types of crushers. Another appointment recently announced is that of Freeman Gates to manage Waldrip's expanding aggregate and mining machinery division. He was former assistant production manager for Consolidated Rock Products Co.

New sales setup for U. S. Pipe & Foundry Co.

United States Pipe & Foundry Co. announces the appointment of George J. Bogs as Los Angeles sales agent. Foster T. Manock will continue his association as sales representative. Bogs and Manock will represent the company directly, terminating the arrangement under which the Water Works Supply Co. had acted as sales agent in Southern California for many years.

Riddle becomes CF&I exec. assistant to pres.

A. M. Riddle has been appointed executive assistant to the president of The Colorado Fuel & Iron Corp., it was recently announced by A. F. Franz, president. With more than thirty years' experience in administrative, sales and operating departments of CF&I, he will now divide his time between the Western and Eastern divisions of the corporation.

New appointment at Fairfield Engineering Co.

William H. McEnally has been made sales manager of the Standard Products Division of The Fairfield Engineering Co. This division of Fairfield designs, manufactures and markets a complete line of construction conveyors, hammermills, bulk bins, feed mixers and other standard products.

McKIERNAN-TERRY West Coast Distributors at the Annual AED Convention included (left to right) *G. R. Compton, Jr.*, McKiernan-Terry Corp.; *A. F. Garlinghouse*, Garlinghouse Bros., Los Angeles; *R. Armstrong*, Garlinghouse Bros.; *C. P. Cramer*, Cramer Machinery Co., Portland, Ore.; *J. How*, Edward R. Bacon Co., San Francisco; *A. Hahn*, Edward R. Bacon Co.; *J. Hatten*, Star Machinery, Seattle, Wash.; *E. R. Evans*, McKiernan-Terry Corp. More than a hundred members of the sixty-five distributor organizations representing the Pile Hammer Division of McKiernan-Terry Corp., met in New York immediately following the Convention. *Earle R. Evans*, vice president of the Construction Equipment Division and his assistant G. Robert Compton, Jr., conducted the group through the all-day program. During their visit to the Harrison, N. J. plant, President *John C. Smalz* in a brief address acquainted the visitors with the varied operations of this plant, and later vice president *Carl W. Shattuck* briefly described to the distributors the operations of the plant at Dover, where several engineers were assigned as guides through the plant.

Space is sold as advertisers' inches. All advertisements in this section are ⅛ in. short of contracted space to allow for borders and composition.

CLASSIFIED

Rates are 8.50 a column inch. Copy should be sent in by the 20th of preceding month if proofs are required; by the 23rd if no proofs are required.

FOR SALE

DULIEN OFFERS...

4 HAMMERHEAD CRANES

(McMyler-Interstate Co. Model BC-1500)

20 TON CAP'Y

Just Removed from Operation

Pintle type with roller thrust bearings
Maximum radius 85'—minimum radius 15'
Cap'y, 20 tons at 60'—17½ tons at 70'—15 tons at 85'
Hoist lift 75' above rails—30' below rails
Boom clearance 82'4" above rails
Boom clearance radius 95'4"
Travel speed 200' per minute
Portal height 19'6"—overall height 102'7"—overall length 136'2¾"
Use on track—25' gauge, 130 lb. rail
Motors: 230 volt DC. Hoist motor 50 hp—travel motor 20 hp—swing motor 20 hp—trolley motor 11 hp.
Equipped with 100KW Diesel Electric power unit. Diesel engine: Superior 120 hp—8 cylinder model GBD-8 (installed new 1950)
Generator 100KW Delco 230 volt DC model 13622

IMMEDIATELY AVAILABLE
LOCATION SEATTLE YARD
COMPLETE SPECIFICATIONS AND INFORMATION UPON REQUEST
WRITE — WIRE — PHONE

DULIEN STEEL PRODUCTS, INC.
OF WASHINGTON
9265 E. Marginal Way, Seattle 8, Washington
12005 Burgaard Ave., Portland 3, Oregon

FOR SALE—Highest Bidder

CLOSING DATE—JUNE 1, 1954

USED BATCHING PLANT

LOCATED OAK RIDGE, TENNESSEE

Johnson Stationary, 129 yards/hour capacity, remote controlled (air operated); 3 compartment overhead storage, sand capacity—45 yds., gravel—45 yds., cement—55 bbl.; 4—1 yd. open type aggregate compartments with beam scales, 16 cu. ft. cement compartment with beam scale; Blaw-Knox 200 gal. automatic weigh tank; 1,000 gal. water tank with coils; 1 cement paddle conveyor with gear reduction and motor; 2 cement elevators, screw fed from railroad, vertical bucket elevators, 900 and 320 cu ft./hour capacity, 600 cu. ft./hour screw fed cement conveyor to batch plant; 2 overhead auxiliary cement storage bins, 300 bbl. and 500 bbl. capacity; RCA sound system; also miscellaneous repair parts and 2 spare electric motors, 7½ HP. and 20 HP.

For details contact Purchasing Agent

MAXON CONSTRUCTION COMPANY, INC.
P. O. Box "S"
OAK RIDGE, TENNESSEE
Telephone 5-3542

FOR SALE

3—420 CFM Schramm Air Compressors
2—500 CFM Gardner-Denver Air Compressors
3—1600 CFM Fuller Rotary Air Compressors
4—Model 34E Rex Pavers
3—D13000 Caterpillar Power Units
Wagon drills, Jackhammers, Tampers and other air tools.

Catalog of used equipment furnished on request.

J. A. Terteling & Sons, Inc.
BOX 1428 BOISE, IDAHO

FOR SALE—Immediate Delivery

INGERSOLL-RAND QUARRYMASTER DRILL

Model QM-8. Serial 11242. Complete with 2—500 cfm. compressors, drill rods and finishing tools. Completely reconditioned and in A1 shape.
Price f.o.b. Bridgeport, Washington.....$45,000.00

INGERSOLL-RAND PORTABLE COMPRESSOR

On rubber tires, 500 cfm. Serial 40 H 41078. Powered by Waukesha Diesel. Very good condition.
Price f.o.b. Bridgeport, Washington.....$6.500.00

MARION TYPE 111-M DRAGLINE

Serial 8477. Equipped with long and wide crawlers, 90 ft. boom and 5 cu. yd. Hendrix bucket. Powered by Cummins Diesel Engine Model L 6.
Price f.o.b. Bridgeport, Washington.....$40,000.00

Contact CHIEF JOSEPH DAM BUILDERS
Bridgeport, Washington Telephone 3501

NAILS! NAILS! NAILS!

MUST SELL THEM

SAVE UP TO 50%

400 kegs 10-d common bright domestic nails.

125 lbs. per keg. Excellent condition.

$7.00 per cwt. up to 10 kegs. Lower prices on higher quantities.

Contact E. C. OFFER
364 Olympic Nat'l Bldg.
Seattle 4, Washington — MAin 5720

LOW COST INSTALLATION AND OPERATION

CABLEWAYS
IMMEDIATE SHIPMENT
ELECTRIC, STEAM or DIESEL
CAPACITY 5 TO 20 TONS
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FOR DAMS, BRIDGES, BREAKWATERS, FILTRATION AND SEWERAGE PLANTS

FOR SPEED, ECONOMY, EFFICIENCY, FLOOD SAFETY, LABOR REDUCTION

AMBURSEN DAM CO INC
295 MADISON AVE NEW YORK

FOR MORE CLASSIFIED
SEE PAGE 154

FOR SALE

STEEL SHEET PILING

NEAR BREWSTER, WASHINGTON

Shipped New — Used Only One Job

Carnegie Length	MP-101 Pcs.	MP-102 Pcs.	Tees Pcs.
72-65 ft.	105	100	2
65-60 ft.	210	50	9
60-50 ft.	210	5	18
50-45 ft.	290	2	7
45-40 ft.	120	1	13

Also quantity 35 ft. and shorter—Quick Shipment Regardless of job, location. Write, Wire or Phone

MISSISSIPPI VALLEY EQUIPMENT CO.
511 Locust St., St. Louis 1, Mo., CHestnut 4474

ADVERTISERS in this issue

BACKFILL, uncompacted

Motherhood must be served

Construction of a $3,000,000 factory was held up recently so two wild black ducks could hatch a dozen eggs undisturbed. They were nesting in an area being cleared by 'dozers for a railroad spur when along came Wrightson Chistopher, a nature lover, and what is more important general manager of the company for whom the factory was being built. He ordered the clearing stopped until the ducks could become parents, two or three weeks by his estimate.

California saves money

Economy paid off in a big way when Frank B. Durkee, California Director of Public Works, reported to the governor that the Division of Architecture had saved more than $3,855,800 on various construction appropriations since January 1.

The savings have been due to current close bidding competition among contractors, re-evaluation of the requirements of state agencies which will use the buildings under construction, and efforts by the architects to keep construction costs at a minimum, Durkee said.

Lost! Grand Coulee Dam

Now we don't feel so badly about the editorial butches that we make from time to time, since it appears that we are not alone in the practice. A recent issue of a monthly magazine published by a division of a large corporation (in the Middle West) hailed the arrival of spring and the tourist season with a sensational cover picture of Grand Coulee Dam, taken from the highway bridge that connects the two parts of the town of Coulee Dam. Unfortunately, the words explaining the cover picture started out: "This shot of Hoover Dam, at the north end of the Grand Coulee River, in Washington . . ."

The caption writer wasn't more than a couple of thousand miles off in his location, since Hoover Dam is on the Colorado River between Nevada and Arizona and Grand Coulee is on the Columbia River in central Washington. Also, there is no such stream as Grand Coulee River.

Wet paint ahead

Colorado's highway department, somewhat perplexed about how to keep motorists from driving across freshly-painted road stripes and carrying most of the paint away on their tires, has adopted the solution worked out in Utah. This consists of stationing state highway patrolmen at each end of the painting project to flag down travelers and hand out small yellow cards with this message: "Wet paint ahead. Do not drive across the wet paint. These lines are being applied for your safety. Keep right—reduce speed. Thank you. Colorado Department of Highways." The cards have been well received and are serving their purpose admirably, according to George N. Miles, department district engineer.

For public's convenience

The last barrier hindering an uninterrupted flow of traffic from downtown Los Angeles to the San Fernando Valley via the Hollywood Freeway was removed a week ahead of schedule, much to the surprise of the motoring public and the California Division of Highways, since the freeway section had not yet been accepted formally.

The opening was made without warning on the initiative of the contractor, Bongiovanni Construction Co., for the public's convenience.

Hail the Queen of U. S. 60

Pretty girls in Phoenix had a chance to compete in a contest to select a Miss Highway 60 Cavalcade Queen recently. The lucky candidate was promised a four-month, expense-paid trip to New York as part of the Cavalcade, formed to publicize U. S. 60.

Our informant didn't let us know how the Queen would travel, but the promoter of the affair, his 11-year-old son, and two friends were scheduled to make the 2,500-mi. trip by horseback, delivering messages from the governor of Arizona to governors of states traversed along the way.

What we can't figure out is how a horseback cavalcade will encourage motorists to use U. S. 60. It seems to us that souvenirs of the Cavalcade, unavoidably dropped along the way, would tend to drive away finicky motorists who might object to having to wash their tires.

Twenty-five years ago in *Western Construction*

Excerpts from a low bid by **S. H. Newell & Co.** of Portland for a portion of the Main Canal, Minidoka Project, Idaho, as follows: 549,000 cu. yd. excavation Class 1—$0.12, 12,500 cu. yd. excav.; Class 2—$0.32, 2,800 cu. yd. excav.; Class 3—$2.00; 170 cu. yd. concrete—$26.00; 10,000 lb. reinforcing steel—$0.04; 620 ft. 24-in. concrete pipe—$1.10; 62M ft. BM erect timber, bridges—$20.00.

* * *

"The 1-cent gas tax which was authorized by the Legislature in 1927 will enable California to increase her highway expenditure. With the funds derived from the 1-cent gas tax, California's annual expenditure per capita will be increased to $6.59 and her annual expenditure per car will be increased to $17.72. Even with this increase in funds, California will continue far lower than the expenditures of the other states . . ."

(Note: California's population was 4,556,000 and motor vehicle registration was 1,693,195.)

* * *

G. E. Goodall, Designing Engineer for the Constant Angle Arch Dam Co. of San Francisco described the Diablo dam (Skagit river development of the city of Seattle) design considerations. He states: ". . . The dam consists essentially of an arch having a crest length of 588 ft., and an upstream radius at the crest of 390 ft. The upper 100 ft. of the arch abuts against gravity sections, which also serve as overflow spillways, while the lower portion of the arch abuts against the rock walls of the canyon. The dam was designed on the assumption that the arch carried all of the water load, no reduction in loading being considered, due to cantilever or verticle beam action."

* * *

"**Julian Hinds,** for the past two years resident engineer in Mexico for the J. G. White Engineering Corp., and formerly with the Bureau of Reclamation, is now an assistant engineer in the Bureau of Water Supply, Department of Water and Power, Los Angeles, of which **H. A. Van Norman** is general manager and chief engineer, and **C. A. Heinze,** assistant."