WESTERN CONSTRUCTION

REVIEW AND FORECAST

JANUARY 1954

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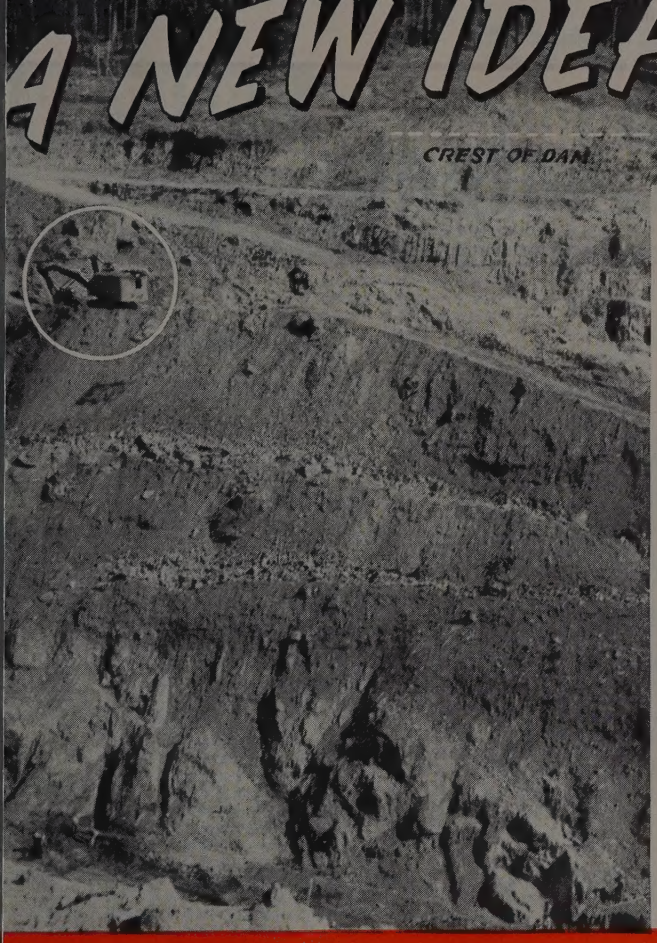

LOOK at the picture at the left! Way up there, toward the future crest of the new Sly Park Dam near Placerville, Calif., is a Northwest Pullshovel developing a new idea in stripping up the ledges for the footings.

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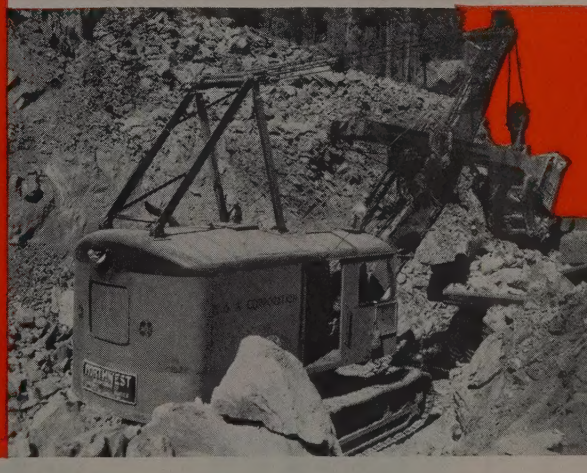

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WESTERN CONSTRUCTION

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ANNUAL REVIEW AND FORECAST

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FRONT COVER

THE ONLY THING MISSING from the cover this month is a dollar sign! And more than a few would be needed to convey the magnitude of heavy construction now under way in the West and programmed for 1954. Arrayed behind the designer of tomorrow's work are the field men, who, during the past year, have placed a record $4,500,000,000-plus volume of construction in the West.

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WESTERN CONSTRUCTION

Editorials

1954—
Another $4,500,000,000 year?

The growth economy characteristic of the West will hold construction volume at a high level in 1954.

At this time a year ago the construction industry had been Number One in the nation for two successive years. Western volume for 1952 appeared to have been just under $4,000,000,000, and this publication estimated that $4,500,000,000 would be a good bet for 1953.

Now that another year has passed and put things in their proper perspective, 1952 volume appears to have surpassed $4,000,000,000, and volume for 1953 only "capped the climax," rising above $4,500,000,000.

The year 1952 was described as one of "conflict between pressure and restraint." The pressure was the total of Western needs for construction. The restraint was that of government control of materials. In 1953 the pressure was the same, but this time the restraint might be called government control over money!

Such control did not, however, affect the magnitude of construction in the West, but only its glamor. Construction by private enterprise did not slacken. The first needs of increasing Western population were served by the builders of houses and super markets and factory additions (as well as entire new plants). Even in the field of public works (the second need), the rescheduling and drawing out of federal programs was more than balanced by a record program for Western highways.

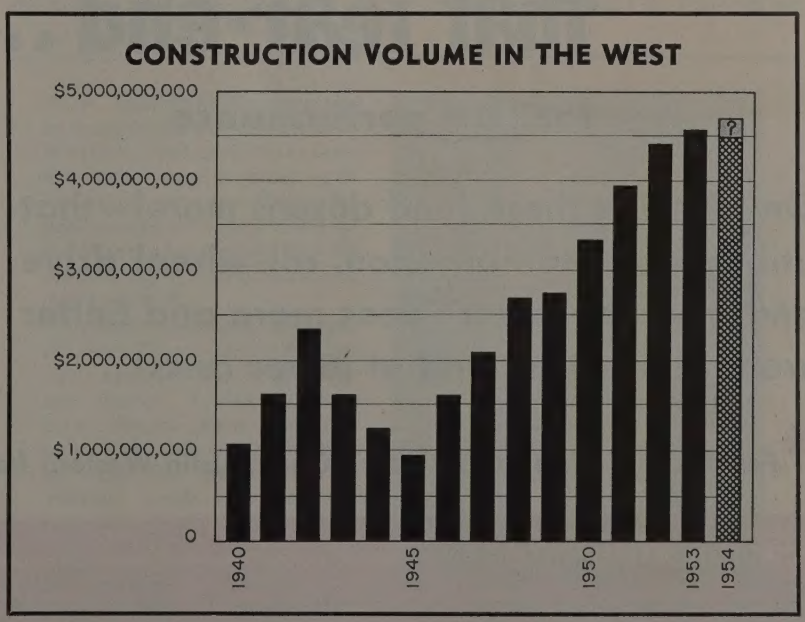
The evaluation of four points provides the best estimate, qualitative, if not quantitative, of what 1954 will bring to the construction West. One of these points is population, and its continuing effects have been indicated. Another is governmental policy. And, with specific regard to the federal government, the policy is not so dire as some have thought. The remaining two points are those of competition among contractors and technical developments.

During the past quarter-century, the glamor of the construction West has been provided, somewhat out of proportion, by the record scope of federal projects on our Western watersheds. The need for watershed development remains undiminished; only the federal spotlight, which provided the glamor, has been turned off. And, for 1954 and subsequent years, there are indications that a precedent of 25 years ago may be revived whereby the "non-reimbursables" of a multi-purpose project would be provided or used by the federal government to aid the credit of a local sponsor.

The element of contractor competition is perhaps the most direct challenge to the construction West in 1954. It will inescapably result in benefit to the buyer of construction and, in the long run, it should prove of value to contracting firms in the form of greater efficiency, better cost control, and improved labor relations. Distinct characteristics of the Western contractor during his relatively short history have been his youth and vigor. The coming year will lay emphasis on these.

Technical developments on all levels of the construction industry have always been important to industry development. They have done much to keep construction service in a competitive position before the buyer. The stature of the West today is a measure of the response of the construction industry to demand, a response enabled by technical developments.

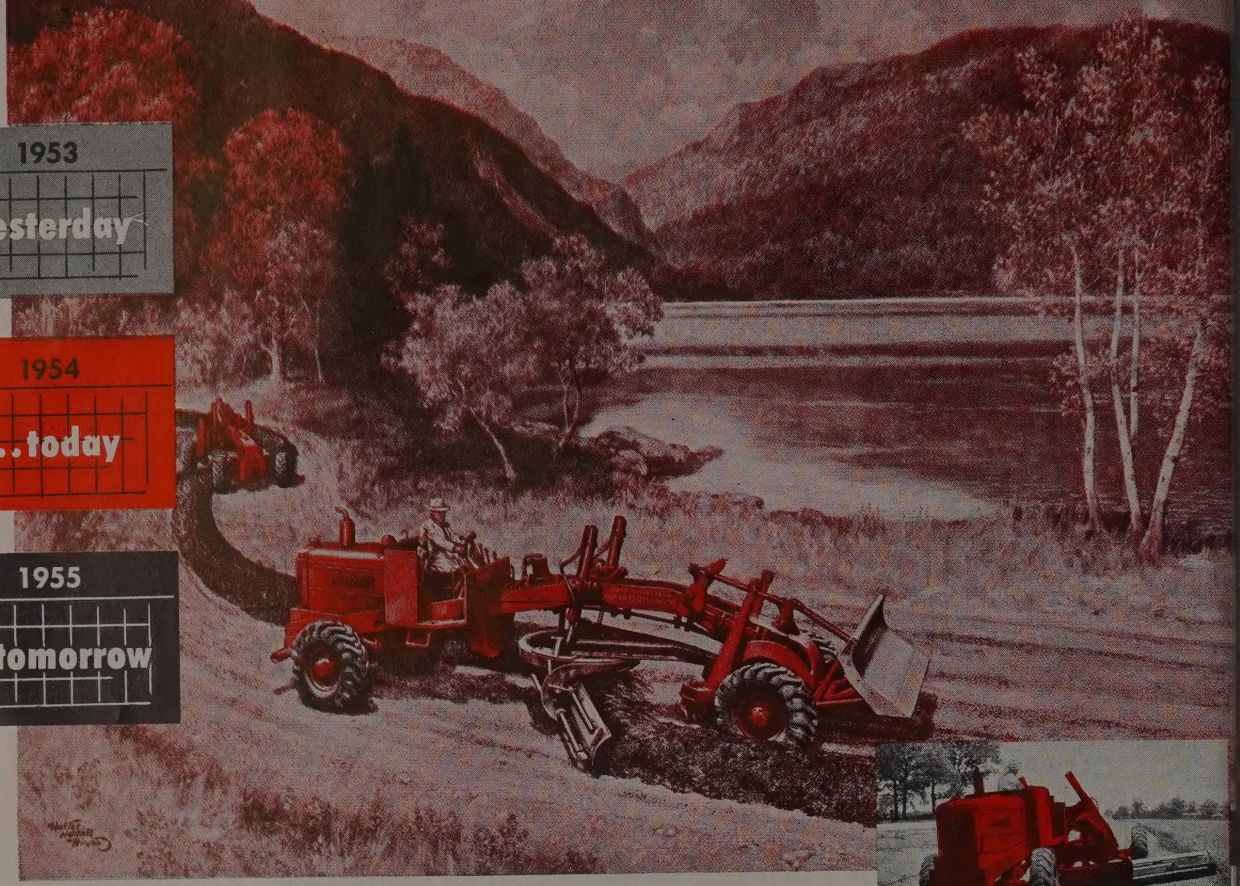
Among the four factors discussed above, three are of a positive nature; only government policy and its interpretation by prophets of doom can be considered negative. Marshalled against it are the uncontrovertible needs of Western population and the daring and ingenuity of Western contractors and engineers. These men will meet the 1954 challenge with sharper management, improved designs, better methods, and more efficient machinery. They will bring another $4,500,000,000 year to the construction West.



1953
yesterday

1954
...today

1955
...tomorrow



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WESTERN CONSTRUCTION

JANUARY 1954

From the Commissioner of Reclamation—

The new approach of the Bureau

—"the construction program on schedule"

—"new projects as fast as they are determined feasible"

—"power generation in its rightful place as a tool of reclamation"

—"research and planning will receive positive emphasis"

—"contracts in force at the end of the fiscal year totaled $260,000,000"

FOR A YEAR now a new administration has directed the course of federal government. As one of the agencies of this new administration, the Bureau of Reclamation has undergone changes in personnel and policy. We in Reclamation have had time to reorient ourselves. I am glad, therefore, to set down briefly in this article some of the items of major significance which the construction industry will want to know concerning the Bureau's new approach.

I believe that Reclamation during this administration will be known for its constructive and businesslike development of the great land and water resources of the West. Reclamation of arid and semiarid lands in the West is far from complete. Many great rivers have yet to be harnessed to serve the people of this nation. It is the purpose of this administration to move forward with the job which the people, through Congress, have given us to do. That job is full of challenge.

Bureau operations surveyed

One of our first moves was to survey the entire operations and organizational setup of the Bureau. We had realized from the outset that the administrative organization of the Bureau was oversized and geared to a much larger program than is possible at the present time. Even before the survey was completed, we accomplished a reduction of over 10% in personnel. At the same time, the construction program proceeded on schedule. We also reviewed our fiscal operations very carefully and determined other ways to save money for the Bureau of Reclamation.

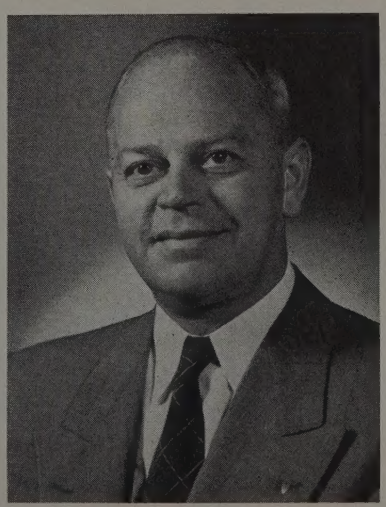
A survey team, designated by Douglas McKay, Secretary of the Interior, was given the job of making a detailed analysis of the Bureau and of recommending changes designed to increase efficiency and coordination. The team submitted its report on October 28, 1953.

Division of responsibility

Of principal interest, the survey team recommended that the Washington office of the Bureau concentrate on staff activities for the Commissioner, such as advising him on policy matters, and in maintaining

W. A. DEXHEIMER's statement on these pages was requested by *Western Construction* to keynote this review and forecast issue. The words carry a confident tone and point to a healthy future for the West, where water and the construction of hydraulic projects mean so much.

William Mulholland once said of water "If we don't get it, we won't need it!" The West so far has "gotten" it; but its needs have thereby been amplified many times. It is well at this time to know that development of Western water resources and reclamation of Western lands are to continue as they have so strikingly begun.—*Editor.*



Bureau changes call for economy and action

RECENT CHANGES in the Bureau of Reclamation organization have been twofold: first, a reduction in force of about 15% as a result of lowered appropriations and demands for economy; and second, action on the recommendations of a survey team appointed in August 1953 to analyze USBR organization and activities.

Recommendations approved and adopted by the Secretary of the Interior affect the top echelon organization of the Bureau, and also the disposition of its outlying offices, including the Denver headquarters.

The Commissioner's offices remain in Washington, D. C., where matters of policy and liaison with Congress will be handled by Commissioner Dexheimer and S. W. Crosthwait, acting assistant commissioner for administrative activities (including supply, programs, finance, personnel, and foreign activities). H. F. McPhail will be assistant commissioner for irrigation and power activities, including the project planning, operation and maintenance, and power utilization divisions.

The Bureau's Denver headquarters will be elevated in status to control all matters of operation and maintenance, planning, and design and construction. In this connection L. N. McClellan, chief engineer of the design and construction branch, is named an assistant commissioner also, in charge of all Denver activities.

Regional offices will remain as before at Boise, Boulder City, Salt Lake City, Amarillo, Billings, and Denver. In addition, the Region 2 office at Sacramento, California, is being re-established with Clyde H. Spencer as regional director. District offices, as such, are to be eliminated, though it is recognized that many of their functions will necessarily be carried by consolidated projects offices. Field offices remain unchanged.

Perhaps the most notable regional reorganization is that of Region 7, headquartered at Denver under Avery A. Batson. District offices of the region at Casper, Wyoming, and at Denver, as well as in the mid-Western states are to be abolished. A consolidated projects office at Loveland, Colorado, will assume the necessary functions of the Casper and Denver district offices during the next 12 months. The new Loveland office will be called the Upper Platte Projects office.

contacts with the executive departments and Congress. Technical phases of operation and maintenance, project planning, and design and construction were recommended for transfer to the Bureau's Denver office — long the center of Reclamation's engineering operations. The team also recommended that L. N. McClellan, chief engineer at Denver, be designated Assistant Commissioner to further implement coordination and efficiency.

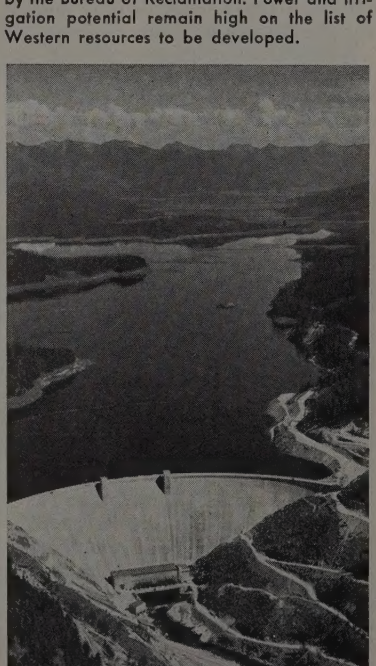
The teams made many other recommendations of worth, including the reduction and consolidation of many units, and the elimination of district offices. The resulting organization is described in a box on these pages.

Many of these changes have already been put into effect. Others will continue to be made with the idea of proceeding with a reclamation program in all of its phases—investigations, construction, and operation and maintenance—with maximum efficiency and economy.

Present projects will continue

The Bureau of Reclamation has never entertained the idea of "closing up shop" or of abandoning projects that are now under way. The Bureau will not only continue its present work of reclaiming lands and taming rivers, but will start new projects as fast as they are determined to be economically feasible and are authorized by Congress. Because of the earnest desire of this administration to operate within a sound budget, we do not anticipate a greatly accelerated reclamation program but rather one of normal growth. In all cases, however, the Bureau will be sensitive to the needs of the people as those needs are expressed through their representatives in Congress.

HUNGRY HORSE DAM, completed in 1953, symbolizes Western reclamation performed by the Bureau of Reclamation. Power and irrigation potential remain high on the list of Western resources to be developed.



Cooperation with local interests

The new approach to federal reclamation will be one of honest cooperation and partnership with local interests. Not only will the inspiration for new projects come from the people, but the Bureau will also depend upon the prospective beneficiaries of new projects to be their own best salesmen. The people are capable of determining their own needs and of making those needs known.

The federal government will also look to local enterprise, to state agencies, and to interstate bodies to undertake jointly the development of river and watershed resources. This job requires the pooling of brains, energy and funds to develop adequately the West in the face of expanding population and the growth of regional industry and business. This concept of cooperation may be new to big-government advocates, but it is grassroots common sense to the people.

Irrigation program primary

Historically and by express intent of Congress, the Bureau of Reclamation is charged primarily with the reclamation and development of agricultural land. Very often reclamation requires the construction of vast works, such as Grand Coulee Dam and its associated pumping plant and distribution system. Sometimes bold schemes are required, such as the Colorado-Big Thompson Project which diverts water from the western slope of the Continental Divide, where there is an excess of water, through a 13-mi. tunnel to the eastern slope, where supplemental irrigation water is needed.

In carrying out this irrigation program, it is often economically feasible and desirable to generate hydroelectric power. In addition, electric power is often essential to the development of irrigation water, and thus power generation is an integral part of a reclamation project. Under this administration, power generation will serve in its rightful place as a tool of reclamation.

Engineers recognize the importance of research and planning. This is another phase of Reclamation work which will receive positive emphasis. Obviously, we cannot wait until the need is upon us before we give thought to the engineering problems involved in development of a par-

ticular river basin. When the people have indicated interest and support in a project, the Bureau of Reclamation will be ready to offer a positive program for the consideration of Congress. In such planning, we will not sit in ivory towers and wait until the last comma is set in our project reports before going to the people for their opinions and suggestions. We have gone on the record as favoring and actively seeking the close cooperation of water users in the development of plans and policies. We ask water users to work with us from first conception of the need until project plans have been converted into concrete and steel irrigation works and the water is flowing onto the land.

Water policy

It has also become time for a national water policy statement. The Bureau, through the Department of the Interior, is endeavoring to work with every interested federal, state and local group concerned with water law and water development in the preparation of a national water policy. The Bureau of Reclamation is now an active exponent of the need for resolving conflicts among the varied agencies concerned with the management of our nation's water resources.

To contractors, the Bureau's program is one of construction through the letting of contracts on a competitive bid basis. Dollar-wise, Reclamation contracts are considerable.

More than 450 contracts in 1953

Total value of all contracts awarded by the Bureau of Reclamation during fiscal year 1953 amounted to about $99,000,000, comprising the face value of more than 450 separate contracts for construction, materials, equipment and supplies. Of this total, construction contracts accounted for $87,000,000, or about 88%. Construction contracts in force at the end of the fiscal year totaled about $260,000,000.

Money invested in Reclamation works creates wealth, as the water and power which are developed become renewable tools for increased agricultural and industrial production.

Construction dollars broaden the tax base wherever those dollars go to work. At every level of our economy —local, county, state and federal— more tax revenues are realized because of the substantial investment in dams, canals, hydro plants and pumping stations.

Resource development through federal reclamation programs has the sincere interest and active support of administration officials, from the President himself to every project and office manager in the field. Reclamation is a strong, going program. Its future will overshadow its present 50-year heritage.

Reclamation Program maintains schedules in 1954

A $174,000,000 fiscal year program covers seven Western states and Alaska — New starts balance completions

THE GOALS of the Bureau of Reclamation construction program, totaling $174,089,769 for the fiscal year ending next June 30, are completion of irrigation facilities to serve 248,000 acres of Western lands and the installation of 295,450 kw. of hydroelectric power capacity.

The accompanying tabulation summarizes Bureau construction accomplishments during 1953 and indicates current construction progress. The following summary surveys briefly the major construction activity planned for the next 6 months to meet the objectives of irrigation and power.

Eklutna Tunnel

Eklutna Tunnel near Anchorage, Alaska, was holed through in the middle of October, right on schedule, despite a 16,000-gpm. flow into the main heading which had earlier stalled the work for three months. The $17,400,000 job, which is now 85% complete, is being done by a joint venture of Coker Construction Co., Peter Kiewit Sons' Co., and Morrison-Knudsen Co., Inc. The combination is called Palmer Constructors, and is headed by A. M. Coker. The tunnel is scheduled for completion in August 1954.

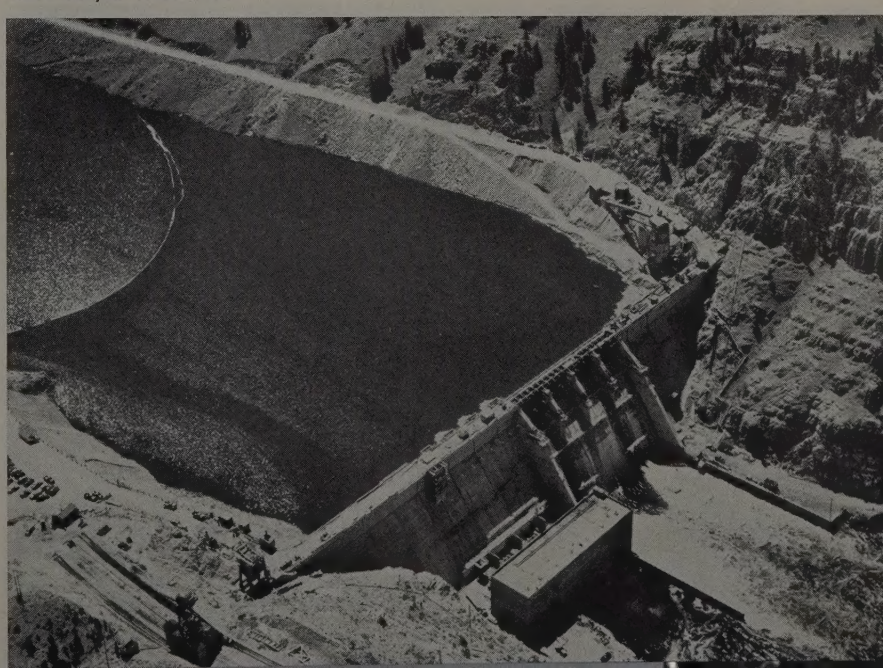
Columbia Basin Project

New construction on the Columbia Basin Project in Washington will include 45 mi. of laterals and wasteways and 6 mi. of concrete pipelines for the Potholes East Canal system; 70 mi. of laterals and 13 relift pumping plants for the East Low Canal system; and 80 mi. of laterals and 4 relift pumping plants for the West Canal system.

Palisades Dam

Palisades Dam, the earthfill structure being built in eastern Idaho, is now about 45% complete. Latest reports from the job say that work on the embankment, powerhouse foundation, stilling basin, spillway tunnel, intake structures, highway relocation, and Snake River bridge substructure continued during the fall season. The $29,180,000 contract is held by a joint

CANYON FERRY DAM and power plant on the Missouri River Basin Project in Montana was essentially finished by the end of the 1953 construction season. The dam was built by a joint venture of Brown & Root, Inc., Griffith Co., Wunderlich Contracting Co., and J. C. Maguire & Co., called Canyon Constructors.



venture of J. A. Jones Construction Co. and Chas. H. Tompkins Co. known as Palisades Contractors. A. L. Pauls is project manager, Paul H. Swanson is assistant project manager, W. H. (Bill) Kennish is general superintendent, and Frank J. Kish is project engineer.

Also in Washington, invitations are to be issued early this year for construction of 7.7 mi. of the Kennewick Main Canal, to be followed by a call for bids in April for an additional 11 mi. of the canal and 4 mi. of the Amon Wasteway.

Sly Park Dam

Sly Park Dam on the Central Valley Project in El Dorado County, California, is now about 25% complete. The job to build this earth-fill structure, which will be about 760 ft. long and 175 ft. high, was awarded to a joint venture of Fredrickson & Watson Construction Co. and M & K Corp. for $2,716,785 in April 1953.

Central Valley irrigation development

On the Central Valley Project in California, the emphasis of construction continues on irrigation development. New construction will include 54 mi. of concrete pipelines and 11 pumping plants for the Delano-Earlimart distribution system and 9 mi. of sublaterals and lateral extensions for the Madera Canal distribution system. For the Friant-Kern Canal distribution system, construction of an additional 45 mi. of pipelines is to be started. A contract for construction of 5.6 mi. of the Camino conduit was awarded in November and this work is expected to start soon.

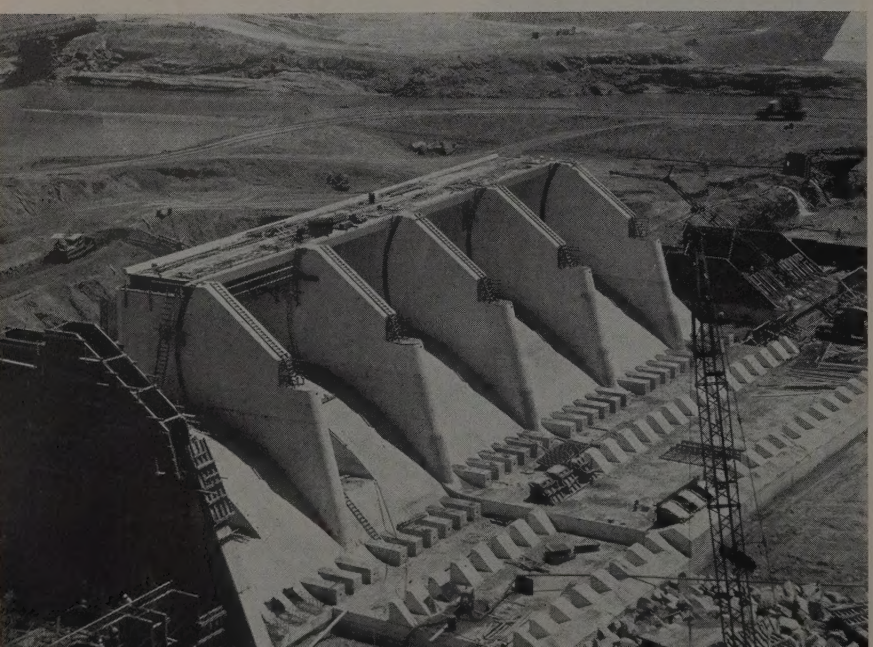
First major work to be undertaken on the Sacramento Canals Unit of the Central Valley Project will include the Red Bluff Diversion Dam, a concrete overflow weir 780 ft. long, and a 12-mi. reach of the 500-cfs. earth-lined Corning Canal.

Western USBR irrigation projects

State, project, feature	Description	Status
ALASKA		
Eklutna		
Eklutna-Anchorage transmission line	26 mi., 115-kv.	Complete
Eklutna diversion tunnel	4½ mi., 11-ft. circular section	Holed through Oct. 17, 1953. 85% complete
Eklutna power plant	30,000-kw.	85% complete
WASHINGTON		
Columbia Basin		
Grand Coulee pumping plant	Initial installation of six 1,350-cfs. units. (Ultimate will be 12)	5th and 6th units in place, May 1953
Potholes East canal	37-mi. reach	Complete
Laterals and sublaterals	327-mi. irrigation works	Complete
Lower and Upper and PE-17 pumping plants	Total capacity 217 cfs. for Potholes East Canal	Complete
Babcock Pumping plant	292-cfs. capacity for West Canal	Complete
Eltopia Branch Canal and laterals	12-mi. reach of canal, 45 mi. of laterals, etc., for Potholes East Canal	Construction begun Nov. 1953
Yakima		
Chandler power and pumping plant	Two 6,000-kw. generators and one 500-cfs. turbine-driven pumping plant. Initial installation is two 167-cfs. units	Construction begun July 1953
Chandler power canal	8-mi. canal	50% complete
MONTANA		
Hungry Horse		
Hungry Horse power plant	Four 71,250-kw. units	Last two units in place, July
Missouri River Basin		
Canyon Ferry Dam and power plant	Dam, and three 16,666-kw. units	First generator in place Dec. 1953. Dam complete
Tiber Dam	Earthfill, 205 ft. high, 4,300 ft. long, 11,363,000 cu. yd., plus 17,000-ft. dike	35% complete
IDAHO		
Palisades		
Palisades Dam and power plant	Earthfill, 260 ft. high, 2,100 ft. long, 13,600,000 cu. yd. Power plant capacity 114,000 kw.	45% complete

Tecolote Tunnel

Work on the Tecolote Tunnel, which is about 80% complete, is being held back by sulphurous gases of volcanic origin, air temperatures reaching 107 deg., and daily water flows ranging between 4,000,000 and 5,000,000 gal. at pressures of up to 300 psi. Carl M. Halvorson, Inc. and H. Halvorson submitted the low bid of $4,750,455 and were awarded the contract for 6.4 mi. of boring and lining. Work started on March 1, 1950.



NIMBUS DAM on the American River in California was about 80% complete in November 1953. Pictured here is the spillway section, seen from the right bank of the river. This concrete, gated diversion structure is a unit of the Central Valley Project. Specifications called for 777,000 cu. yd. of excavation on this job.

under construction in 1953-54

CALIFORNIA		
Central Valley		
Folsom-Elverta transmission line	20 mi., 230-kv.	Complete
Folsom power plant	162,000 kw.	50% complete
Nimbus Dam and power plant	Concrete, gated diversion structure, 800 ft. long. Power plant capacity 13,500 kw.	80% complete
Sly Park Dam	Earthfill, 190 ft. high, 760 ft. long, plus a 600-ft. dike 130 ft. high.	25% complete
Cachuma		
Cachuma Dam	Earthfill, 275 ft. high, 3,000 ft. long, 6,500,000 cu. yd.	Complete
Glen Anne Dam	Earthfill, 102 ft. high, 250 ft. long, 300,000 cu. yd.	Complete
Tecolote Tunnel	6-mi., concrete-lined, 7-ft. diameter	80% complete
Solano		
Monticello Dam	Concrete arch, 295 ft. high, 1,000 ft. long, 260,000 cu. yd.	Construction begun August 1953
San Diego		
San Jacinto-San Vicente Aqueduct	71-mi. water supply pipeline, concrete, various sizes	55% complete
ARIZONA		
Gila		
Laterals and sublaterals	42 mi. of the Mohawk distribution system, 20 mi. of the Wellton distribution system	Complete
UTAH		
Weber Basin		
Gateway Tunnel	3-mi., concrete-lined, 9.3-ft. diameter horseshoe	50% complete
COLORADO		
Colorado-Big Thompson		
Pole Hill power plant	33,250 kw.	In operation, 1953
Flatiron power and pumping plant	Two 31,500-kw. generators and one reversible pump-turbine unit, 6,700 kw.	Plant and afterbay complete, power generation 1954
Willow Creek Dam and pump canal	Earthfill, 105 ft. high, 1,000 ft. long, 387,000 cu. yd.; and 1-mi. canal	Complete
Boulder Creek supply canal	13-mi. section	25% complete

Bids are to be invited early this ear for completion of Folsom and Nimbus power plants, newest Central Valley Project power features.

Folsom Power Plant

Construction on Folsom Power Plant was plagued during early 1953 y rain-caused floods on the Amer-can River in California. (*Western Construction*—June 1953, p. 141; March 1953, p. 96; February 1953, p. 2.) Despite these floods which vashed out cofferdams, the project is bout 50% complete. The Guy F. At-inson Co. is building the plant under $5,800,000 contract.

Nimbus Dam and Power Plant

Construction on Nimbus Dam, a e-regulation structure 7 mi. down-tream from Folsom Dam on Califor-ia's American River, and Power Plant is about 80% complete. The roject is being built by a joint ven-ure of Winston Bros. Co. and Al Johnson Construction Co., who submitted a low bid of $6,067,353. Bid invitations for completion of the job, which includes turbine installation and miscellaneous erection, are expected to be issued in March 1954. A. T. Evans is project manager.

In the Southwest, on the Boulder Canyon Project, a call for bids for supplying the 145,000-hp. hydraulic turbine for Unit N-8 of the Hoover Power Plant was issued late in 1953. Unit N-8 will have a generating capacity of 104,500 kw. Installation of this unit, planned to go on the line about June 1957, will bring the plant's total installed capacity to 1,354,300 kw.

Gila Project

New work planned to be started by early summer on the Gila Project in Arizona comprises the following: 28 mi. of laterals and sublaterals for the Wellton distribution system; 22 mi. of laterals and sublaterals for the Mohawk distribution system; 6 mi. of laterals and sublaterals for the Wellton-Mohawk distribution system, and 12 mi. of laterals and sublaterals for the Dome distribution system.

In Utah, new Weber Basin Project construction will include the following: Wanship Dam, an earthfill structure 156 ft. high and 2,000 ft. long, having a volume of about 3,000,000 cu. yd.; 8.5 mi. of the Gateway Canal; 21 mi. of concrete pipe for the Davis Aqueduct, and 4.5 mi. of concrete pipe for the Weber Aqueduct.

Canyon Ferry power plant

On the Missouri River Basin Project, largest of the Bureau's multiple-purpose developments, construction progress will be highlighted by the installation of the remaining two 16,666-kw. generating units for the Canyon Ferry power plant in Montana early this year. Other power facility construction will include the 211-mi., 230-kv. transmission line to be built between Big Bend, South Dakota, and Granite Falls, Minnesota, and the construction of the 86-mi., 230-kv. Jamestown-Fargo transmission line in North Dakota.

Missouri Diversion Dam

Other new work on the project will include construction of the Missouri Diversion Dam near Frazer, Montana. The dam will consist of 2.2 mi. of earth dike embankment across the Missouri River, a 40 ft. high gated concrete overflow section, and 350 ft. of concrete retaining walls. Completion of Webster Dam, an earthfill structure in Kansas having a volume of about 7,400,000 cu. yd., is expected to get under way early this year. (The dam foundation was completed late in 1953.)

Tiber Dam

Tiber Diversion Dam in Montana, part of the Missouri River Basin Project, is now about 35% complete. The construction contract of $12,838,190 is held by a joint venture of James Construction Co. and Wunderlich Contracting Co.

Basin irrigation canals

Irrigation facility construction in the Basin will include construction of 9.9 mi. of the Franklin Canal, Nebraska; 12 mi. of the Kirwin Main Canal, Kansas; and 5 mi. of the Franklin Canal and 29 mi. of Franklin laterals in Nebraska.

Further information regarding details of construction for the above features and for other work can be obtained from the Bureau's *Advance Construction Bulletin*, which contained in December a special supplement forecasting new work to be undertaken through June of this year. Copies of the bulletin can be obtained by addressing the Bureau's Chief Engineer at the Denver Federal Center in Denver, Colorado.

1954 Western Highway Programs

Highway department budgets totaling more than $350,000,000 point to 1954 as another big year for Western contractors

WESTERN HIGHWAY PROGRAMS for 1954 will provide a major source of construction work in the West. Highway budgets are continuing to increase in size, with some of the states appropriating the highest sums in their history for construction and maintenance of these facilities. Funds totaling more than $350,000,000 have been set aside for highway construction in the 11 Western States and Alaska during the calendar year of 1954.

Three major factors point to a long-range Western highway program that will expand and accelerate faster than the national average. They are: growth in population, number of cars operated per unit of population, and dependence of the West on highways as a means of transporting passengers and freight.

The story of what the 11 Western States and Alaska did in 1953 and hope to do during 1954 follows:

ALASKA—

CONSTRUCTION FORECAST of the highway program of the Alaska Road Commission for the next construction season includes plans to spend about $9,000,000 improving and surfacing the main highways, plans to spend about $4,000,000 in construction of two new highways, the Denali Highway and Copper River Highway, and plans to spend about $1,000,000 improving existing feeder roads and bridges.

Among the major projects which were started in 1953 and which will be continued into the 1954 construction season are two in the Valdez District under the jurisdiction of H. W. Johansen, the district engineer.

The first is a $2,083,853 contract to grade and drain 45.37 mi. of the Richardson Highway held by Morrison-Knudsen Co., Inc. The job was 68% completed at the end of the 1953 season, with completion date set for Nov. 15, 1954. Personnel included A. L. Brown, project superintendent; H. A. Stephan, resident engiener; and J. R. Wilson and C. W. Counts, assistant resident engineers.

The second project involves grading, drainage, and bridge construction on 41.078 mi. of the Richardson Highway under a $2,543,757 contract, also held by Morrison-Knudsen Company, Inc. This job was 8.6% complete at the end of the season. Completion date is November 1, 1955. Personnel on this job include Bruce Shumway, project superintendent; R. A. Johnson, resident engineer; and Dave Jones, assistant resident engineer.

Both of the above projects, the first in section G of the highway and the second in section D, include bringing the roadway to a subgrade 28 ft. wide, placing gravel base course 24 ft. wide, and laying bituminous mat surfacing 20 ft. wide.

A third major project, under the jurisdiction of M. C. Zimmerman, Fairbanks district engineer, is located on Section D2-E of the Glenn Highway from Tok toward Big Timber. It consists of grading, surfacing, and bituminous surfacing 60.429 miles of the highway under a $1,445,424 contract held by McLaughlin, Inc. The entire job consists of light grading to secure a stable subgrade 28 ft. wide, laying a 4-in. crushed gravel base course to a width of 24 ft., and placing a 1½-in. bituminous mat surfacing to a width of 20 ft. This project was 28% completed by the end of the season.

Project personnel include D. E. Hecht, project superintendent; C. H. Williams, resident engineer; and Don Durnell, assistant resident engineer.

A fourth major project provides for grading and paving the Alaska Highway, which has such a widespread romantic appeal that many inquiries are received concerning it, southward from Tok to a point about half way to the Canadian border. The Alaska Highway is already improved and paved from Tok to its northern terminus.

This job is being constructed under a joint contract by the C. F. Lytle Construction Co., Green Construction Co., and S. Birch and Sons Construction Co. for $2,196,719. The job includes heavy grading involving considerable improvement in alignment to secure a 28 ft. wide subgrade, a 24 ft. wide gravel base course, and a 20 ft. wide bituminous surface. This job was 53% complete at the end of the 1953 construction season. When the job is 100% complete, there will be only about 42 mi. left to complete paving all of that part of the highway which lies within Alaska.

Personnel on this project include Wade Jones, superintendent; Frank Morris, resident engineer; and Paul N. Wagner, assistant resident engineer.

Headquarters personnel of the Alaska Road Commission include A. F. Ghiglione, commissioner of roads for Alaska; William J. Niemi, chief engineer and contracting officer of the Alaska Road Commission, H. B. Schultz, chief of the engineering division; F. E. Baxter, chief of the road design branch; R. J. DeLaHunt, chief of the bridge design branch; V. D. Stewart, Jr., chief of the operations division; and J. I. Noble, chief of the contracts branch.

RUNNING EASTWARD into Nevada from the California state line, U. S. 40 has been realigned and made into a four-lane, divided highway. Lots of excavation was needed as cut slopes were laid well back to improve sight distance.

ARIZONA—

ARIZONA has budgeted about $8,000,000 for 12 major projects expected to be let out to bid sometime before June 30, 1954. An additional $8,500,000 will be spent on jobs between July 1 and December 31, according to present plans, making a total expenditure of $16,500,000 during 1954.

Among the major projects still under construction are two contracts totaling $747,847, one held by Tiffany Construction for $433,847 and Arizona Sand & Rock Co. for $314,000. These two contracts are the initial construction on the divided-highway section of the new Black Canyon Route entering Phoenix. Both projects consist of constructing two roadways, 32 and 36 ft. wide, with bituminous plant-mix surfacing. When the expressway is finished, these roadways will serve as frontage roads. No interchange structures are provided in the present contracts, which are scheduled for completion on June 30, 1954. These two contracts total 8 mi. of road construction.

Pioneer Constructors is working on a $358,721 contract to grade and drain 2.8 mi. of U. S. 80 near Mountain View. Completion date is February 28, 1954. This job is part of a project to place a base course and bituminous plant-mix surface 40 ft. wide over 8 mi. of new alignment. Contracts for two bridges and an underpass are scheduled to be let before July 1, 1954. The completed project is scheduled to be opened to traffic about June 30, 1955.

New alignment and reconstruction of 4.6 mi. of U. S. 66 west of Holbrook is being handled under a $363,953 contract held by Western Constructors. The job includes placing a 40 ft. wide bituminous plant-mix surface. Completion date is October 31, 1954.

Another major contract is held by Fisher Contracting Co. for $370,779. The job includes 3.8 mi. of construction on U. S. 66 east of Winslow. R. C. Perkins is State Highway Engineer of Arizona.

CALIFORNIA—

ABOUT $300,000,000 in state highway construction will be under way during the 1954 calendar year, according to R. M. Gillis, deputy state highway engineer. This sum includes about $181,000,000 worth of construction projects which were either under contract or advertised for bid on January 1. In addition, the 1954-1955 fiscal year budget provides $131,387,000 for major construction projects. Contract awards will be made on and after April 1, 1954, and the major portion of the total sum will be placed under contract during 1954. This is the biggest highway budget in the history of the state.

The budget provides for 180 projects for improving a total of 585 mi. of highway, including multi-lane urban freeways, intercity expressways, and rural routes. The largest single item in the budget is an allocation of $8,550,000 for construction of 3.9 mi. of the Ramona freeway near El Monte. The next largest is a $6,000,000 item for 4.7 mi. of U. S. 40 on the new freeway location in Contra Costa County.

Representative contracts currently under construction include a viaduct on the Bayshore Freeway in San Francisco. The design, fabrication, and erection of the steel work on an adjacent section of this project were described in the September 1953 issue of *Western Construction* on pp. 78-81. The present job, which is almost 0.7 mi. long, is being built by Guy F. Atkinson Co. on a contract for $3,229,087. It is about 50% complete.

B. W. Booker, assistant state highway engineer, has this project under his general supervision. George W. Thompson is resident engineer. The actual bridge design was performed in the headquarters office under the general supervision of F. W. Panhorst, assistant state highway engineer.

Also under construction is a project to grade and surface with portland cement concrete pavement on cement-treated subgrade 3.0 mi. of U. S. 99 just north of San Fernando. This project, being built by the Griffith Company on a $3,301,510 contract, includes the construction of seven bridges. The project is about 10% complete.

State highway personnel include P. O. Harding, assistant state highway engineer, general supervisor of the job, and R. H. Butler, resident engineer.

A third major project involves the grading and paving with concrete of 4.0 mi. of the West Sacramento Freeway (U. S. 40) plus construction of a reinforced concrete bridge. This project is being built by B. J. Ukropina, T. P. Polich, Steve Kral, and John R. Ukropina under a $1,299,550 contract. This job is now approximately 52% complete.

This project is under the general supervision of A. M. Nash, district engineer, and Muller Chapman, resident engineer.

Another project, which is neither under construction nor provided for in the budget, is a parallel tube under the Oakland Estuary between the cities of Alameda and Oakland. This second tube entered the news early in December when the Department of Public Works applied for a new permit to the Corps of Engineers for the second underwater crossing. The permit, which asked an allowance of 3 yr. from the date of approval before commencing actual construction, was necessary because an original permit expired in December 1953.

The proposed tube, estimated to cost $15,000,000, will be about 3,300 ft. long and will be located 450 ft. west of the existing two-lane Posey Tube. If approved, it will carry two additional lanes of traffic below mean low water at a clearance of 38 ft. Legal authority exists for construction of the proposed tube. It may be financed and constructed as a part of a toll revenue bond project under provisions of the California Toll Bridge Authority Act.

George T. McCoy is State Highway Engineer of California.

COLORADO—

COLORADO's Department of Highways has been operating under a new financial setup since January 1, 1953, when the department changed from a calendar to a fiscal year basis and prepared a budget which ran for 18 mo., or until June 30, 1954.

By January 1, 1954, there were 105 projects, covering 746 mi. at a total cost of $26,652,000 either placed under contract or let out to bid. This is by far the greatest sum ever put under contract in Colorado in any one year. Available funds for major construction in 1954 will be about $20,000,000.

Several major projects were completed late in 1953. One was a $579,716 contract to grade and surface 6.3 mi. of U. S. 85-87 near Castle Rock. Major quantities of material included 433,000 cu. yd. of unclassified excavation, 1,200,000 sta. yd. of overhaul, 114,000 ton mi. of overhaul, and 90,800 lb. of structural steel.

Department personnel on this job included Adolph Zuliam, design engineer, William J. Walsh, construction engineer, and D. R. Mitchell, resident engineer. The contractor was

MORE than 115,000 heavy axle loads were applied to the WASHO test road in southeastern Idaho by November 1, according to the Highway Research Board. Test traffic uses the road at a rate about equal to that on heavily-traveled routes. Since mid-July, when some of the thin sections had been damaged (*Western Construction*—August 1953, p. 99), very little visible distress has been observed. No damage has yet been noted on any of the thicker test sections. Operations continued until the subgrade froze this winter. At the time the report was written, it was estimated that each test section would have undergone about 140,000 axle load applications before the freeze set in. Regular test loads of 32,000- and 40,000-lb. tandem axles and 18,000- and 22,400-lb. single axles will be operated through the critical spring breakup. No tests were made on the pavement during the spring of 1953.

Henry Shore. He had Nate Shore, earth superintendent, and Arlie Bailey, structural superintendent, on the job.

Another major job consisted of grading and building structures on 14 mi. of U. S. 6 near Derby. The $370,188 contract, held by J. H.-N. M. Monaghan & Associated Companies, involved the following major quantities of material: 524,000 cu. yd. of unclassified excavation, 3,010,000 sta. yd. of overhaul, 125,000 yd. mi. of overhaul, and 160,000 lb. of reinforcing steel.

Contractor's personnel on this job included O. E. O'Donnell, superintendent, and H. R. Evans, estimator. Department personnel included Adolph Zuliam, design engineer, William J. Walsh, staff construction engineer, and Linn Hart, resident engineer.

IDAHO—

IDAHO'S BOARD of Highway Directors has approved a tentative budget for the 1954 calendar year of $16,080,000 for new construction. This sum is intended to cover 26 new projects on the primary state highway system and 21 new projects on the secondary state highway system. In addition, 10 projects which were scheduled for construction in 1953, at an estimated cost of $3,638,000, will be contracted for in 1954. These "carry over" projects were deferred because of right-of-way difficulties or other unanticipated delays.

Federal-aid financing will provide an additional $4,135,000 for county road projects, $660,000 of it carried over from the 1953 program.

The 1954 contract maintenance program adopted by the highway directors calls for an expenditure of $1,084,000 for such items as surface rehabilitation, stockpiles, seal-coating, building, and bridge repair.

Surveys and advance right-of-way acquisition on 56 projects on both the state primary and secondary systems are listed in the program at estimated costs, for the surveys and plans, of $532,000. The cost of right-of-way acquisition is $1,158,000. An additional 22 projects for surveys, carried over from 1953, are scheduled for 1954 at a cost of $98,000.

E. V. Miller is State Highway Engineer of Idaho.

MONTANA—

MONTANA plans to let about $14,000,000 in construction projects during 1954, provided funds are available and other varying circumstances permit.

Among the major projects which are currently under construction is a $736,590 job to grade, gravel surface, and place road-mix oil on 4 mi. of U. S. 87 and 89. Quantities involved include 1,191,899 cu. yd. of excavation, 2,314 lin. ft. of drainage, 68,200 cu. yd. of surfacing material, and 121,363 gal. of bitumen. Roadway width is 32 ft., surface width is 24 ft., and pavement thickness is 13 in. The project started November 19, 1953, with completion date stipulated at September 15, 1955. Albert LaLonde Company holds the contract. Don DeVore is state highway engineer for the division and Charles W. Heber is project engineer.

A steel and concrete bridge over the Flathead River on the Somers-Big Fork Road is being built by James Crick & Sons, under a contract for $497,091. Quantities involved in this job include 120,319 lb. of reinforcing steel, 1,354.6 cu. yd. of Class A concrete, 476 cu. yd. of Class AD concrete, 11,700 lin. ft. of foundation piling, 771,600 lb. of structural steel, and 1,367 lin. ft. of steel bridge rail. The bridge, which is 686 ft. long, was 6% complete at the time of this report, with completion date July 31, 1955.

State highway personnel on the job include Ray Spurzem, division engineer, and S. D. Larson, resident engineer.

A third major project in Montana is being built by the F & S Contracting Co. under a $539,551 contract. It consists of grading, gravel surfacing, and draining 4.6 mi. of U. S. 93.

This job includes 558,740 cu. yd. of unclassified excavation, 1,337 lin. ft. of drainage, and 57,651 cu. yd. of surfacing material. The gravel surfacing is being laid to a thickness of 12 in. and the roadway is being built to a width of 32 ft. Work on this job started Oct. 20, 1953, with the completion date set at August 15, 1954.

Ray Spurzem is division engineer and W. J. Hebert is project engineer for the highway department on this job.

Scott P. Hart is State Highway Engineer of Montana.

NEVADA—

NEVADA'S CONSTRUCTION and maintenance program for 1954 will total about $13,000,000. Of that amount, nearly $11,000,000 will be spent on construction and reconstruction, about $2,000,000 will be spent on maintenance, and some $300,000 has been set aside for snow removal and administration.

Two projects have been completed recently. The first, a 2.5-mi. section of U. S. 40 from Verdi to the California state line, was a four-laning job done by the Isbell Construction Co. for $771,198. Of particular interest on this job was the fact that 11,810 lin. ft. of guard rail was called for in the specifications. The second was a 29-mi. stretch of U. S. 93 north of Wells, built by a joint venture of Dodge Construction, Inc., and Silver State Construction Co. for $1,268,295.

Three major jobs are in the planning stage for 1954. They are similar in that the cost of each is expected to be about $1,000,000.

The first, in Sparks, involves the erection of a bridge over the Truckee River, an underpass beneath a railroad track, and construction of 1 mi. of secondary road. The bridge will be a three-span continuous structure with two cantilever sections constructed of reinforced concrete. The center span will be 120 ft. long and the two side spans will be 86 ft. long each. The cantilevers will be 18 ft. The bridge is being designed with a 1,221-ft. radius curve, a 30-ft. roadway, and a 5-ft. sidewalk on one side.

The underpass will consist of three structural steel continuous spans, one 35 ft. long and the other two 51 ft. long. They will be fabricated from 36-in. I-beam with 2½-ft. centers. Quantities involved include 1,109,000 lb. of structural steel, 110,000 lb. of reinforcing steel, and 2,000 cu. yd. of concrete.

The secondary road will be built with stage construction methods, the first contract to provide a 40-ft. road-

THIS REINFORCED concrete bridge is being built in Yolo County, California, by B. J. Ukropina, T. P. Polich, Steve Kral, and John R. Ukropina. It is part of a $1,299,550 contract which involves grading and paving about 4 mi. of the West Sacramento Freeway.

STATUS OF FEDERAL-AID HIGHWAY PROGRAM

As of October 31, 1953

ACTIVE PROGRAM

STATE	PROGRAMMED ONLY		PLANS APPROVED Construction Not Started		CONSTRUCTION UNDER WAY		Total	Total Available for * Programming
	Total Cost	Federal Funds	Total Cost	Federal Funds	Total Cost	Federal Funds	Cost	
Arizona	$ 2,190,000	$ 1,497,000	$ 1,070,000	$ 758,000	$ 7,093,000	$ 5,029,000	$ 10,353,000	$ 8,396,000
California	5,550,000	2,969,000	11,892,000	4,159,000	97,843,000	49,321,000	115,285,000	58,159,000
Colorado	3,991,000	2,258,000	3,244,000	1,835,000	16,809,000	9,084,000	24,044,000	15,659,000
Idaho	7,195,000	4,497,000	2,781,000	1,767,000	11,786,000	7,442,000	21,762,000	16,106,000
Montana	12,472,000	7,609,000	4,543,000	2,916,000	13,104,000	7,843,000	30,119,000	23,307,000
Nevada	5,485,000	4,591,000	725,000	607,000	4,276,000	3,542,000	10,486,000	11,770,000
New Mexico	1,164,000	747,000	2,960,000	1,863,000	8,990,000	5,664,000	13,114,000	9,414,000
Oregon	1,602,000	956,000	817,000	465,000	12,634,000	7,640,000	15,053,000	10,756,000
Utah	2,860,000	2,191,000	708,000	532,000	10,562,000	8,057,000	14,130,000	11,413,000
Washington	9,160,000	4,804,000	1,643,000	860,000	16,254,000	8,553,000	27,057,000	15,491,000
Wyoming	1,537,000	992,000	1,928,000	990,000	7,510,000	4,864,000	10,975,000	7,228,000
TOTAL	$53,206,000	$33,111,000	$32,311,000	$16,752,000	$206,861,000	$117,039,000	$292,378,000	$187,699,000

*Federal funds only. Consists of 1955 fiscal year apportionments, plus unprogrammed balances from previous fiscal years.

bed with provisions for future widening to a four-lane divided highway.

The second major project is for a two-lane, plant-mix surface on 20 mi. of U. S. 6, 93 and 50 from Ely to the west slope of Connor's Pass. Excavation will be about 283,000 cu. yd.

The third job, also to be built in stages, is construction of a four-lane, divided highway on 6 mi. of U. S. 40 starting 9 mi. east of Reno. About 875,000 cu. yd. of roadway excavation has been set up, most of it in hard rock requiring a considerable amount of blasting.

H. D. Mills is State Highway Engineer of Nevada.

NEW MEXICO—

NEW MEXICO has tentatively budgeted $18,000,000 for construction work and another $5,500,000 for maintenance in 1954.

Among the major projects which are just starting in New Mexico is a contract for the surfacing and blacktopping of 34 mi. on U. S. 54, between Carrizozo and Corona. Termination of this job will complete U. S. 54 as a paved highway all the way across the state, with a corresponding increase in the amount of traffic using it expected as soon as the work is completed. The contract itself covers almost 50 mi. This extra mileage includes work on state connections and sealing of 12 mi. of the existing pavement. This mostly includes ballast, placing a leveling course, and surfacing with hot plant mix.

Lowdermilk Brothers holds the $716,866 contract. Major quantities include 179,720 tons of ballast, 101,285 tons of leveling course, 18,109 bbl. of 85-100 penetration asphalt, and 49,750 tons of hot plant asphaltic pavement. The leveling course is 30 ft. wide and 3 in. thick while the hot plant mix pavement runs from 22 ft. at the top to 24 ft. at the bottom of a thickness of 2 in. R. E. Long is resident engineer for the highway department. For a description of a previous paving job in New Mexico, see *Western Construction*—June 1953, pp. 66-67.

Another project, which will provide another paved highway entirely across the state when it is finished, is a $204,630 job to pave 7 mi. of U. S. 285 between Ojo Caliente and Chamita. This gap had been left for a number of years waiting for decision as to the location of a much-needed dam on the Chama River. The decision has not yet been made, and it was finally resolved that the department would go ahead and build a road anyway, and move it later if the dam is ever built.

The work, which is being done by Floyd Haake, consists of grading, drainage, watering, rolling, ballast, leveling course, asphalt penetration surface treatment, and miscellaneous construction. Major quantities involved include 16,160 tons of leveling course, 148,386 cu. yd. of unclassified excavation, 254,459 station yard overhaul, 44,493 quarter-mile yard haul, 41,065 ton-mile haul, and 20,725 tons of ballast. The ballast will be placed at an average width of 27½ ft. and a thickness of 9 in.; the leveling course will be 24 ft. wide and 3 in. thick, and the final single penetration service will be 20 ft. wide.

M. W. Gibbs is resident engineer in charge for the highway department.

A bridge across the Rio Grande on U. S. 85 in Albuquerque will have the decking and superstructure work going full force in 1954. J. H. Ryan & Son has the $488,309 contract for the superstructure. This same contractor completed the substructure during 1953. The contract includes the 1,500-ft. length of the bridge itself plus the approaches, making the total length 0.868 mi. This bridge, when finished, will make U. S. 85 a four-lane highway, since it parallels another bridge already in place.

Material involved in the superstructure contract for the bridge calls for 1,300 cu. yd. of class AE-AR concrete, 222,000 lb. of reinforcing steel, and 1,771,500 lb. of structural steel. Walter E. Brown is the resident engineer on the project.

C. O. Erwin is Chief Highway Engineer of New Mexico.

OREGON—

OREGON will enter the year 1954 with $29,000,000 worth of construction remaining to be finished under contracts already awarded and on which the work is already in progress. Expenditures against this total during 1954 will amount to about $24,000,000. Additional contracts totaling $31,000,000 are scheduled for 1954 letting, and it is anticipated that expenditures on these contracts will come to $18,000,000 during the year.

Source of the funds to be expended includes $8,500,000 from federal aid, $7,500,000 from road-user revenues, and $26,000,000 from the sale of bonds. The bond money is part of a $72,000,000 bond authorization approved by the 1951 and 1953 state legislatures to advance construction on some of the more urgent projects in the State's $400,000,000 "needs" program.

Contracts to be let during 1954 will range in amount between $10,000 and $1,500,000. The work principally involved will include grading, bridges, grade separation structures, rock base, and asphaltic concrete paving. The smaller contracts will be let for oiling, bituminous surfacing, landscaping, traffic lights, and guard rails.

Among the major projects which have been started is the 24-mi. unit of Oregon's new expressway between Portland and Salem which extends from the Willamette River to Hayes-

HEAVY GRADING on the four-lane highway between Monitor and Miller Street in Wenatchee, Wash., preparatory to applying the ballast and surface courses. This section of the road, when finished, will connect with the Wenatchee River bridge.

ville. When completed, this four-lane expressway will be graded 50 ft. wide in each direction of travel. There will be a 30-ft. parkway or median strip between northbound and southbound roadways. Each roadway will have a 24 ft. wide asphaltic concrete pavement with oiled rock shoulders on each side.

Grading of the northerly unit of 12 mi. was awarded November 6, 1953 to R. A. Heintz Construction Co. at an estimated cost of $735,000. About 1,100,000 cu. yd. of excavation is involved. Bids have been called for grading of the south unit and paving of the traffic interchange at Hayesville. This work involves 1,270,000 cu. yd. of excavation at an estimated cost of $1,150,000. Structures, estimated at $1,435,000, and paving, estimated at $2,500,000, for the whole 24-mi. section will be contracted early in 1954. Completion date of the entire job is scheduled for October 31, 1955.

Similar expressway construction is under way on an 11-mi. section of the Portland-Salem Expressway, which will extend the Willamette River-Hayesville improvement north to a point 6 mi. south of Portland. Construction on this adjoining section is due to be completed by August 1954.

Another important project involves reconstruction of the 28-mi. section of the Oregon Coast Highway (U. S. 101) between Port Orford and Wedderburn in Curry County. This work is about half contracted, the latest unit being the Rocky Point-Brush Creek Project.

Peter Kiewit Sons' Company was awarded the contract to grade and pave 5.44 mi. on this particular portion of the job at an estimated cost of $1,110,000. Quantities involved are 1,115,000 cu. yd. of excavation, 46,000 cu. yd. of rock or gravel base, and 16,000 tons of asphaltic concrete pavement.

The normal grading section is 36 ft. wide and the pavement is 22 ft. wide with 4-ft. shoulders. The base under the pavement is to be 9½ in. thick, including a bituminous binder course. The asphaltic pavement will be constructed in two courses, a base course 2 in. thick and a wearing surface 1½ in. thick. The roadbed and pavement will carry an extra width of 10 ft. on grades to provide climbing lanes for trucks. The four structures to be built on this unit will be contracted for early in 1954 at an estimated cost of $200,000.

A third major project involves relocation of U. S. 99 south of Roseburg between Shady and Booth Ranch, at a saving in distance of approximately 5 mi. Grading of the 6.7-mi. section is scheduled for contract in January 1954. The grading involves 2,250,000 cu. yd. of excavation at an estimated cost of $2,000,000. Structures and paving, to be contracted for separately, will cost about $1,200,000. Tentative completion date has been set in the late fall of 1955.

R. H. Baldock is State Highway Engineer of Oregon.

UTAH—

UTAH has set aside the sum of $10,635,000 to pay for its approved highway program for 1954. Included in this sum is $7,453,000 in some form of federal aid program and $3,182,000 in projects sponsored by the State. Broken down to mileage, this amounts to 161.7 mi. in federal aid projects and 44.4 mi. in state projects.

Among the major projects being built in Utah is construction of a 32-ft. roadway to replace an obsolete 18-ft. wide section in Spanish Fork Canyon on U. S. 6 and 50. The job includes placing a 6- to 8-in. gravel base course, 3 in. of gravel surfacing, and 3 in. of plant-mix bituminous surfacing by W. W. Clyde & Co. on a $570,950 contract.

This project was 89% complete when work stopped late in November. Part of the bituminous surfacing work remains to be done. Personnel on the job include E. G. Johnson, chief engineer; Sheridan Fiack, construction engineer; Robert R. Hickman, district engineer; and Jim West, resident engineer.

Other work under way includes a 5.9-mi. section of roadway about 4 mi. east of Echo. The job consists of placing plant-mix bituminous surfacing on a 36-ft. roadway and building some new alignment. This project, being constructed by Floyd S. Whiting for $710,820, is about 63% complete.

Young & Smith Construction Co. was low bidder on a job to realign 7.9 mi. of graded roadway on U. S. 30S and 189 and build three concrete structures over 20-ft. span for an ultimate width of 36 ft. The bid price was $642,337. R. E. Dobbs is overhead structure resident engineer and J. F. Vallandingham is roadwork resident engineer. Chief Bridge Engineer O T. Peterson designed the overhead structure.

The last two projects are under the direction of E. G. Johnson, chief engineer; R. B. Patterson, construction engineer, and Jack H. Craven, district engineer.

WASHINGTON—

THE WASHINGTON State Highway Commission plans to award about $45,000,000 in highway contracts during 1954. Contract awards during 1953 totaled $33,000,000.

Among the typical construction jobs under way in 1953 was a contract awarded to Goetz & Brennan for clearing, grading, draining, surfacing, and constructing a light bituminous surface treatment on 14.7 mi. of State Highway 7. Construction of a reinforced concrete box girder bridge was included in the contract, which amounted to $507,148. Quantities mentioned in the plans included 96,480 tons of selected roadway borrow, 54,105 tons of crushed stone surfacing top course, 247,340 cu. yd. of common excavation, and 121,720 cu. yd. of solid rock excavation. Travel lanes were broadened to a width of 11 ft. and the shoulders were broadened to a width of 8 ft.

Resident engineer on the project for the Department of Highways is R. S. Rider. Design work was under the direction of Roy Tillman, district engineer in Spokane, and R. H. Kenyon, engineer of plans and contracts.

One more step in the construction of a by-pass on U. S. 99, so through traffic can avoid downtown Seattle congestion, came on September 17, 1952, when a contract for $2,384,060 was awarded to Morrison-Knudsen Co., Inc., for construction of the Battery Street Subway. Construction of

this subway was described in the July 1953 issue of *Western Construction* on pp. 76-78. The new subway, completion date for which has been set in April 1954, will connect the recently-completed, $6,000,000 Alaskan Way Viaduct to Aurora Ave., the present route of U. S. 99.

When completed, the tunnel will have four lanes, each 12½ ft. wide. A feature of design is an automatic ventilation and fire control system.

State Highway Department personnel on the job are P. C. Leonard, resident engineer; Tommy Thomason, inspector; and Inge Tringstad, chief of party. John C. Rumsey, Jr., is project manager for the contractor.

A third major project under construction is the most costly bridge ever built by the Washington State Highway Department. It is being built across the Chehalis River between Aberdeen and Cosmopolis to carry traffic on State Highway 13. The award, for $3,364,625, went to MacRae Brothers. (For a description of how the piling for this bridge was driven, see *Western Construction*—September 1953, pp. 72-73.)

Total length of the new bridge is 1,141 ft., including the approaches into Aberdeen. A sidewalk 4½ ft. wide will be provided for pedestrians on each side. Quantities mentioned in the plans include 12,400 cu. yd. of structure excavation, 27,000 cu. yd. of concrete, 1,459,000 lb. of steel reinforcing bars, 2,482,000 lb. of structural carbon steel, and 1,771,000 lb. of structural low-alloy steel.

R. W. Finke is construction superintendent for MacRae Brothers. Vern L. Dorsey is resident engineer, and Jack Claypool is Department of Highways district engineer supervising the job. The bridge was designed by the Department of Highways Bridge Division under the supervision of George Stevens.

Another major contract, performed by D-H Paving Co. for $331,670, has just been completed. It involved paving a section of a newly-graded, four-lane highway in Wenatchee. Quantities involved included 14,770 tons of crushed-stone surfacing top course, 35,060 of crushed stone surfacing from stockpile, and 14,580 tons of ballast.

Department personnel on the job included Edgar Sloane, resident engineer, and Richard Barber, district engineer. Design work was supervised by R. H. Kenyon, engineer of plans and contracts.

The sum of $9,219,393 has been allocated for federal financing of road construction in Washington for the fiscal year ending June 30, 1954. This total breaks down as follows: federal aid primary highway system, $4,064,587; federal aid secondary highway system, $2,715,106; federal aid primary highway system in urban areas, $2,024,855; and interstate highway system, $414,845.

FEDERAL FOREST ROADS

Total funds available for programming in fiscal year July 1, 1953, to June 30, 1954:

Arizona	$1,224,172
California	3,084,850
Colorado	1,545,607
Idaho	2,195,228
Montana	1,713,715
Nevada	386,856
New Mexico	866,648
Oregon	2,969,754
Utah	716,012
Washington	1,498,097
Wyoming	919,953
Alaska	1,880,603
Total	$19,001,495

Although use of these funds has been planned, the money has not as yet actually been appropriated by Congress. The Western Association of Highway Officials took note of this fact in its recent convention at Santa Fe. The group pointed out that the Western states have spent more money than has the federal government on construction of forest roads and borne all the cost of maintenance, and that failure to appropriate the $53,400,000 now authorized by Congress seriously handicaps planning and building of needed highways.

Therefore, WASHO respectfully requested the proper officials "to take the necessary steps to appropriate the $30,900,000 of the 1953 and 1954 fiscal year forest highway funds now authorized by the Congress and apportioned . . . to insure that the program for planning and building forest highways may continue in an orderly manner."

Approval of all three routes for highway bridge crossings of Puget Sound as proposed by the Washington State Toll Bridge Authority will be recommended to the Chief of Engineers, provided that such bridging "will not unreasonably interfere with navigation," and "provided that the bridges on only one of the three routes be constructed and that certain minimum clearances be provided for navigation over the main waterways," according to Col. N. A. Matthias, Seattle district engineer.

The three routes are located as follows: Route No. 1 involves the construction of four bridges, one across the East Passage of Puget Sound from Brace Point at the south limits of Seattle to Dolphin Point on Vashon Island, one across Colvos Passage from Point Vashon to Point Southworth, one across Rich Passage at Point White, and one across the upper end of Sinclair Inlet west of Port Orchard.

Route No. 2 would require construction of five bridges, one across East and one across West Waterways at West Florida St., Seattle; one across Puget Sound from Alki Point to Restoration Point; one across Rich Passage at Point White, and one across Sinclair Inlet west of Port Orchard.

Route No. 3 would require only three bridges. One would extend across Puget Sound from near West Point in Seattle to Skiff Point on Bainbridge Island, one across Port Orchard just south of Fletcher Bay, and the third across Port Washington Narrows in line with Warren Ave. in Bremerton.

Although all three routes are recommended for approval, the Army Engineers has suggested certain modifications in structure on individual bridges for the benefit of navigation.

W. A. Bugge is Director of Highways.

WYOMING—

WYOMING, which spent about $15,000,000 in 1953 on its highway budget in building or contracting for 700 mi. of highway, will have a 1954 budget of about the same amount. This total includes new construction, maintenance, operating costs and overhead.

About $10,000,000 will be spent on 300 mi. of new construction on primary and secondary federal aid projects. Some $2,500,000 of this total will be spent on state projects, financed entirely by state highway department funds.

Construction of another 300 mi. or more is planned under state-county and county farm-to-market programs. This figure is contingent upon plans and priorities to be set up by county commissioners.

Maintenance costs run around $2,500,000 annually, and miscellaneous costs will take the other $2,500,000 of the budget.

Some of the major projects under way or yet to be let in Montana include construction of 13 mi. of U. S. 30 in Sweetwater County. This $1,500,000 project began in 1952. About 5 mi. of surfacing remain to be completed in 1954.

Laramie County has several projects lined up in and near Cheyenne which will total more than $1,000,000.

A third major project consists of building 3 bridges and 10 reinforced culverts plus grading and surfacing 10.2 mi. of highway in and near Sundance. The contract for building the bridges and culverts went to N. A. Nelson Construction Co. for $178,970. The highway construction job was awarded to Summit Construction Co. for $659,500.

From a construction standpoint, the department is striving for a standard of 48-ft. (shoulder to shoulder) subgrade width with 28 ft. of paving on interstate roads where traffic volume warrants this, as in the case of the Lincoln Highway (U. S. 30). In much of the wide-open country, however, there is only light traffic over sections of the primary system. Here such standards cannot be justified or financed.

J. R. Bromley is Superintendent of the Wyoming Highway Department.

Civil works take the spotlight in 1953-54 as—

U. S. Engineers build for the West

Military construction for Army and Air Force holds high level, but progress is most spectacular on Northwest dams — The West takes 50% of Army civil construction funds

APPROPRIATIONS for civil works and authorizations for military construction, both for the current fiscal year, total nearly $1,000,000,000 for the Corps of Engineers. As has come to be almost a tradition, Western projects concerned with flood control, navigation and—to a lesser extent—power construction account for 50% of the national total in these important categories. A table with this article indicates the localities and individual projects for which the federal funds are earmarked.

It is more difficult to evaluate the military construction program being performed in the West under the administration of the Corps of Engineers. Authorizations for the current year do not, in themselves, take any account of work that is already under way. Also, large quantities of federal funds are intended for construction of a classified nature. In order to determine the construction significance of military work in various portions of the West, it is necessary to review activities in the various districts of the Corps of Engineers.

THE NORTHWEST . . .

Activities of the Corps of Engineers in the Northwest, as reviewed in the following paragraphs, are those of the Seattle, Walla Walla and Portland districts. Civil works projects alone that are scheduled to be advertised during the next six months total more than $95,700,000. All of this work is in the Columbia River Basin which, for the entire fiscal year, represents over $110,000,000 in work.

Military work, here as elsewhere, is difficult to assess. However, about $12,000,000 of such construction is expected to be accomplished during the remainder of this fiscal year in the Seattle District alone. In addition, military work totaling $11,000,000 is anticipated for carryover to the following fiscal year, and a large portion of this will probably be placed during the current calendar year 1954. A conservative total of $20,000,000 in military construction is, therefore, expected by the district during 1954, according to Col. N. A. Matthias, District Engineer.

Elsewhere in the Northwest, the Walla Walla District, not resting on $8,000,000 of military construction achievement during 1953, foresees expenditures in 1954 of $25,000,000. It is to be noted that the expenditures "scheduled" for 1954 do not include any project for which Congress has not appropriated funds. The range of work includes extensive technical, maintenance, and housing facilities, as well as air base aprons and runways.

Albeni Falls Dam

Among the individual civil works, Albeni Falls Dam, a multi-purpose project on the Pend Oreille River in Idaho, has received substantially all the money required for virtual completion in fiscal year 1955. The powerhouse is under construction by Albeni Constructors, and first power on the line is planned for the latter part of 1954.

On the Columbia River, Chief Joseph Builders, prime contractor on the big dam, closed operations for the winter in November with the $30,000,000 contract standing about 90% complete. Up until that time, nearly 817,000 cu. yd. of concrete had been placed. Gate piers have been completed on the left half of the spillway and monoliths of the right half have been raised, but left below full height to allow for spring flood flows before completion.

The $40,000,000 contract held by Columbia River Constructors, for Chief Joseph powerhouse and intake structures, continues through the winter. Concrete placement on this work totaled nearly 539,000 cu. yd. early in December. Penstocks and scroll cases are being installed.

At McNary Dam $224,000,000 of an eventual $286,000,000 in construction work has been accomplished. Except for the main generators, the project is now about 95% complete and it is expected that McNary Dam Contractors (a joint venture of Guy F. Atkinson Co., Ostrander Construction Co., and J. A. Jones) will finish up during 1954.

Cascade Constructors, a combination of Wismer & Becker, P. S. Lord Mechanical Contractors, A. S. Schulman Electric Co., and Morgan Electric Co., hold a $3,300,000 contract for the installation of the main turbines and most of the other mechanical and

MORE POWER on the Columbia will be generated at The Dalles Dam, where powerhouse work has advanced 8% since last July. Excavation is about 90% complete, and The Dalles Powerhouse Constructors, materials plants ready, have started pouring concrete.

electrical facilities on the project. S. Morgan Smith Co. is supplying the turbines, and General Electric is supplying and installing the first 12 generators. At 70,000 kw. each, these are the largest of their kind ever built.

Design of McNary Dam for the Corps of Engineers has been under the direction of E. C. Franzen. Resident engineer in charge of construction has been S. G. Neff. Al Davis and Richard Earnheart, successively, have served as project engineers. John Morton has been on the job as project manager for McNary Dam Contractors since the beginning.

Lucky Peak Dam

A major point in progress on Lucky Peak Dam was passed in December 1953 when the embankment section was topped out by the contractor. This $19,300,000 project on the Boise River consists of an earthfill dam 2,400 ft. long and 260 ft. high, with a concrete intake tower, steel-lined tunnel, and downstream control structure. Prime contractor on the work is a joint venture of Morrison-Knudsen Co., Inc., J. A. Terteling & Sons, Inc., Macco Corp., and Puget Sound Bridge & Dredging Co. Project manager is Woody Williams.

The project is scheduled for completion late in 1955. Major remaining work consists of intake tower and outlet control structure, construction of which is being handled on a $2,600,000 contract held by Russ Mitchell, Inc., and Bruce Construction Co. J. D. Agnew, Jr., is superintendent for the joint venture.

Project engineer at the job for the Walla Walla District, Corps of Engineers, is W. J. Murphy. Additional work on the project to be contracted during the coming year includes an estimated $65,000 in reservoir clearing, $764,000 in slide repair on roads and highways in the reservoir area, and $120,000 in auxiliary buildings.

The Dalles Dam

At The Dalles Dam, a $14,438,000 contract is held by Guy F. Atkinson Co. and Ostrander Construction Co. The work includes a concrete dam, and also the spillway tainter gates and excavation for the tailrace and approach channel. Over 1,500,000 cu. yd. of channel excavation are involved, in addition to 650,000 cu. yd. of excavation for the dam and stilling basin. Other major quantities include 331,000 cu. yd. of concrete and 6,028,000 lb. of steel reinforcement. As 1954 begins, this contract is estimated to be about 44% complete. With the major excavation work finished, and the contractor's concrete production facilities ready to go, concrete placement has just recently gotten under way.

A second major contract at The Dalles is held by The Dalles Powerhouse Constructors (Donovan Construction Co., C. F. Lytle Co., S. Birch & Sons Construction Co., Foley Brothers, Inc., Winston Brothers Co., J. L. McLaughlin, and F. & S. Construction Co., Ltd.). The $29,821,000 contract covers completion of excavation for and construction of the substructure for the first 14 main unit bays of the powerhouse, a record structure with a length of 1,462 ft. and a height of 200 ft. The work involves nearly 500,000 yd. of excavation, 614,200 cu. yd. of concrete. Progress on the work is estimated about 8%.

Resident engineer at The Dalles for both of the principal contracts is H. B. Elder. A. H. Steiner is project manager for Atkinson and Ostrander. A. R. Bacon is project manager for The Dalles Powerhouse Constructors.

Lookout Point Dam

Lookout Point Dam on the middle fork of the Willamette River is nearly complete — 98%. The $20,700,000 contract is held by a joint venture of Morrison-Knudsen, Peter Kiewit, and Macco. During the last six months of 1953 the earth dam was brought up from an average elevation of 850 ft. to final grade of 941 ft., this work representing about 820,000 cu. yd. of embankment.

Resident engineer for the Corps of Engineers at Lookout Point is S. R. Overholser. L. E. Steelman is project manager, and D. W. Lutes is project engineer for the contractor.

All major contracts for Dexter Dam, reregulating unit for Lookout Point, have been awarded except the powerhouse installation contract which is scheduled for April 1954. Dam closure is scheduled for June, completion and reregulation in September, and power on the line in

Civil Works construction funds Corps of Engineers

FISCAL YEAR 1954

CALIFORNIA	
Cherry Valley Reservoir	$ 200,000
Folsom Dam	8,800,000
Humboldt Harbor	250,000
Los Angeles County drainage area	6,200,000
Merced County stream group	300,000
Pine Flat Reservoir	2,900,000
Sacramento River	3,800,000
San Antonio Reservoir	1,700,000
Whittier Narrows Reservoir	5,200,000
IDAHO	
Albeni Falls Reservoir	6,840,000
Lucky Peak Reservoir	1,500,000
MONTANA	
Havre	400,000
NEW MEXICO	
Rio Grande Floodway	300,000
OREGON	
Amazon Creek	245,000
Lookout Point Reservoir	18,000,000
McNary Lock and Dam	26,350,000
The Dalles Dam	32,000,000
Willamette River, bank protection	310,000
WASHINGTON	
Chief Joseph Dam	23,350,000
Total for West	$138,645,000
Rest of nation	138,125,000
Grand total, construction	$276,770,000

NEARING COMPLETION are three 225-man barracks at Oakland Army Base. Stolte, Inc., is prime contractor on this $1,230,000 job, where the three structures, built end to end, will stretch out for 971 ft.

INTAKE AND POWERHOUSE construction at Chief Joseph Dam looked like this in November. This $40,000,000 job of Columbia River Constructors is the biggest of three contracts now in force totaling over $73,000,000.

April 1955. The contract for construction of this earth and gravel fill dam, the powerhouse, spillway and other works, totaling $5,034,000, is held by McNutt Brothers and C. V. Montag & Sons. Overall progress now stands at 48%.

Detroit Dam on the North Santiam River in Oregon was completed in 1953, and its two 50,000-kw. generators have been in operation for several months. Big Cliff reregulating dam, part of the Detroit project, is still under construction. Consolidated Builders, Inc., holds the $4,260,000 contract for construction. Very little major work remains on the structure, the main dam and appurtenant works having been completed by the end of 1953.

W. A. Mackie is project engineer for the Corps of Engineers. For Consolidated Builders, R. H. Hoffman is general superintendent and V. A. Palmer is project engineer.

Activities of the Corps of Engineers in the Northwest are under the supervision of Brigadier General D. G. Shindler, North Pacific Division Engineer. District engineers include Colonel N. A. Matthias at Seattle, Colonel T. H. Lipscomb at Portland, and Colonel F. S. Tandy at Walla Walla.

MOUNTAIN STATES . . .

Military installations in the Mountain States of the West, a tradition dating back to the frontier days of the region, have been augmented in recent years by large volumes of construction for Air Force installations, particularly in central Colorado and in New Mexico. By contrast, civil works constructed by the Corps of Engineers have not assumed a large continuing degree of significance since navigation is not a principal concern on streams of this part of the West. Corps of Engineers activity in the field of flood control has been considerable, principally in the upper reaches of the Missouri River and its tributaries and along the Rio Grande in New Mexico.

Most of the military work in these states is administered by the Albuquerque District. On the other hand, much of the civil works is conducted by three districts—Garrison, Omaha, and Fort Peck—of the Missouri River Division.

As of the beginning of 1954, contracts in force in New Mexico alone totaled $13,000,000, with the expectation of another $20,000,000 in work to be placed under contract during the first six months of the year. Activity later in 1954, in the new fiscal year, is contingent upon Congressional appropriations and directives, and no firm estimate can be made at this time.

Jemez Dam

A major achievement in New Mexico during the past year has been completion of Jemez Dam on a Rio Grande tributary near Albuquerque. The final work on Jemez Dam was represented by a $1,500,000 contract held by Hinman Brothers Construction Co. The structure is 135 ft. high, 800 ft. long, and has a base thickness of 800 ft.

Kirtland Air Force Base at Albuquerque continues to be the scene of considerable military construction activity. At present, two major contracts in progress are held by Robert E. McKee for construction of two double cantilever hangars. Contract amounts are $1,806,870 and $1,795,100. Progress at the beginning of 1954 on this work is estimated at about 20%, with completion scheduled for October of 1954.

Other major work proposed for the year at Kirtland will include storage facilities and shops, a headquarters building, and extensive airfield paving. Project engineers on this work for the Corps of Engineers are Max W. Howard and George I. Tippin.

White Sands Proving Grounds

At White Sands Proving Ground, building construction accounts for most of the current activity. An engineering test laboratory is being built by Robert E. McKee on a contract for about $1,300,000. The work is about 30% complete. Another major structure is the data reduction building being erected by Campbell & Kay on a $700,000 contract.

Both the foregoing structures are scheduled for completion before mid-1954. Additional work coming up includes dormitory and barracks, laboratory and test buildings, roads, storage facilities, and shops and warehouses. Project engineer for the Corps at White Sands is James S. Wilborn. The work described at White Sands, as elsewhere, is for the first six months of 1954, and the continuation of each project is contingent upon action by administrative authority.

Far to the north a flood protection project at Havre, Montana, is the focus of Corps of Engineers' civil works activity in the Mountain States. A contract for the Bull Hook unit of the project was awarded in August 1953 by the Fort Peck District. The work consists of two earthfill dams and a channel to divert flood flows from creeks south of Havre into a coulee which bypasses the town. The work involves about 1,800,000 cu. yd. of earthwork. The $787,900 contract is held by J. Kenneth Thayer Construction Co. of Salt Lake City.

Fort Peck Dam

At Fort Peck Dam, planning is in progress for installation of a second power plant to have a capacity of 80,000 kw. The present plant has an installed capacity of 85,000 kw. The new plant is estimated to cost $23,300,000.

Downstream from Fort Peck, progress on the Missouri River Basin development by the Corps of Engineers (the Pick-Sloan plan) has now completed its eighth year of construction. At this time about 75% of the authorized projects under the plan have either been completed or are in construction. A brief summary of the status of the more important projects follows:

Garrison reservoir is now about

63% complete. The past year was marked by closure of the river section in April. Contract work on the fifth and final stage of the earth embankment will be under way before the end of the calendar year 1954. The outlet works should be substantially completed during the next six months, while work continues on the spillway and power plant, and on relocations required by the project.

Fort Randall Dam is now about 75% complete and is expected to be essentially finished during the calendar year. The first power unit, 40,000 kw., is scheduled to go on the line in February.

A major contract for the upstream portion of the flood control tunnels and outlet works of Oahe Dam was awarded in October to Mittry Constructors of Los Angeles on a bid of $9,459,600. Previously, in August, a contract for Stage 3, earthwork, had been awarded. Now about 10% along in construction, the project is scheduled for completion in 1961.

Activities of the Corps of Engineers in the Mountain States are handled both by the Southwestern Division, headed by Col. H. D. Vogel, and the Missouri River Division, headed by Brig. Gen. W. E. Potter. District engineers at Albuquerque, Garrison, Omaha and Fort Peck are Col. L. C. Barnes, Col. H. L. Hille, Jr., Col. T. J. Hayes III, and Lt. Col. E. A. Tillman.

THE SOUTHWEST . . .

More or less arbitrarily, in order to coincide with the jurisdiction of various Corps of Engineers' districts, construction projects administered from Sacramento, San Francisco and Los Angeles will be considered in the following paragraphs as belonging to the Southwest. The region thereby encompassed includes California, Arizona, Nevada and portions of Utah.

Estimated total volume of military construction for the Army and Air Force administered by the Corps of Engineers during the coming year totals a little over $100,000,000 for the Southwest. As has been the case during the past two or three years, installations for the Air Force account for most of this anticipated volume. In fact, such work alone exceeds the estimated $25,500,000 in civil works to be constructed during the year.

San Francisco District

During the first half of 1954, military construction totaling $15,000,000 or more is slated to be undertaken by the San Francisco District. For the last six months of 1954—the first half of the coming fiscal year—program planning is still in the tentative stage. However, present indications are that new construction at Army and Air Force installations during that period will approach, and perhaps exceed, the $10,000,000 mark.

As in previous years, the San Francisco District dollar volume of military construction far exceeds that of civil works. For example, civil works construction funds approximating $1,200,000 will be available to the district during the first half of the year.

A general breakdown of the military construction work now on the planning boards and scheduled to go out for bid between now and next July, together with approximate dollar amounts, is as follows: Administration and training facilities, $7,500,000; airfield paving, $2,000,000; barracks and mess halls, $1,750,000; communications facilities, $700,000; fuel distribution and storage, $400,000; navigational aids, $100,000; utilities, $1,000,000; warehouses and storage, $2,000,000.

Under the present schedule, one of the largest and most varied programs is at Castle Air Force Base, where the district has a multi-million dollar program under way. Projects slated to be advertised for bids between now and next July at this base include an instrument landing system, motor maintenance shop, vehicle parking area, alert hangar, runway strengthening, armament and electronics and ammunition shops, alert and operational aprons, utilities and various administrative and storage facilities.

FROM THE AIR, river channel improvements near Los Angeles resemble the area's famed freeways. This is Rio Hondo, where A. Teichert and Bressi & Bevanda are winding up a $2,456,400 contract for the Los Angeles District of the Corps of Engineers.

Fort Ord

One of the largest construction jobs under way in the district is at Fort Ord, where Del E. Webb Construction Co. has a $13,000,000 contract for construction of 31 barracks. The structures are in varying stages of progress; however, the overall project now stands about 90% complete. This job is under direct supervision of the South Projects Office, administered by Colonel Warren Heilig. Assistant Projects Engineer is Knute Hannston. J. N. McPhee is supervising construction for the Del E. Webb company.

One of the district's newest military projects is at Hickam Air Force Base on the island of Oahu in Hawaii. The Hawaiian Dredging Co., Ltd. began work there on a $2,500,000 contract for airfield paving and runway apron improvement. This job is under the jurisdiction of the Honolulu Area Office. Lt. Col. Sidney Shelley is Area Engineer.

Folsom Dam

In Sacramento District the spotlight is held by civil works construction, principally at Folsom Dam, where about $8,000,000 in expenditure is planned. The prime contract for Folsom Dam is held by a combination of Merritt-Chapman & Scott Corp. and the Savin Construction Corp. The original bid was $29,444,000. During past seasons, the work has been marked by unfortunate delays due to high river flows and unsuspected geologic conditions, and also by better-than-schedule progress on individual items, with the overall result that completion schedules may very nearly be met. Concrete placement in the river section of the dam has been proceeding steadily during the recent construction season and the dam is now to such size that it is anticipated that normal schedules can be maintained during the coming winter and spring months.

C. F. Beatie is project engineer for the Corps of Engineers on the Folsom project. D. E. Stinson is project manager for the contractor.

Additional civil works construction by Sacramento District during the next six months totals about $3,324,000. Work on the Sacramento River itself in the interests of flood control accounts for a little over $2,000,000 of this.

Farther south, projected commitments for 1954 for military construction in the Los Angeles District are estimated very approximately at $51,000,000, broken down somewhat as follows: Air Force construction in Arizona, $9,000,000; in Southern

Concluded on page 96

Population growth in the West sparks —

Industrial and commercial building

Another boom construction year is forecast for 1954 based on plans for industrial expansion, increasing need of better housing and schools

ANOTHER BOOM YEAR for industrial and commercial construction in the West is apparently in prospect. Indications are that it will equal or better 1953 construction, which, in most states, had surpassed all previous records before the year was over.

The bulk of this planned construction is made up of new industrial plants, expansion of and additions to existing plants, office buildings, homes, schools, and utilities, including water supply, power, and sewerage projects, all encouraged by pressure of rapidly expanding population all over the West.

One indication of a big building year for 1954 is the number of hotels and other facilities planned for such recreation areas as Phoenix, Alaska, and Hawaii. Another is the number of big office buildings going up in metropolitan centers like San Francisco, Denver, Albuquerque, and Seattle. Construction of these types of buildings usually keynotes a building boom, because these buildings are the first to be scratched from future planning when the economy is on a downward trend.

It should be noted that this report of construction does not cover any street or highway work other than that mentioned as being performed exclusively by city or county governments. State highway construction, both past and future, is covered in another article in this issue.

ALASKA—

LARGEST INDUSTRIAL construction in the Ketchikan area is a $55,000,000 pulp mill being built for the Ketchikan Pulp Co. as a joint venture of the Puget Sound Pulp and Timber Co. and the American Viscose Co. of Philadelphia. Completion is scheduled for early in 1954. Two more private ventures under construction are apartment buildings, 11 and 13 stories high, at a cost of about $1,500,000 each.

Public works in Alaska will have a 1954 budget of nearly $10,000,000, with schools and utilities accounting for most of it. Schools in Anchorage, Ketchikan, Fairbanks, Kodiak, Sitka, Seward, and Juneau will cost about $6,031,500.

Utilities for Ketchikan, Anchorage, Fairbanks, and Valdez will cost about $3,479,000. These utilities include sewer systems, a water supply and distribution system for Ketchikan, a sewage line in Fairbanks, and a water system for Valdez.

ARIZONA—

PHOENIX SEEMS to be the center of non-highway construction activities in Arizona. Much of the private construction is concerned with the tourist trade, with $459,000 scheduled for construction of resorts and guest lodges, $1,311,000 for apartment buildings, $267,850 for additions to motor hotels, and $228,000 for swimming pools.

Major construction by the City of Phoenix involves expansion of the water system at a cost of $3,500,000. Construction, including laying concrete steel reinforced pipe ranging up to 60 in. in diameter, is due to be finished in 1954.

Luke Air Force Base will be the scene of a project to reinforce and extend runways for jet aircraft, involving expenditure of around $5,000,000.

Power enters the picture at Red Rock, where the Arizona Public Service Co. is constructing a 200,000-kw. plant, at a cost of $24,500,000, to produce power for the San Manuel Mining Co., and the new town being built to house its workers. Mining facilities which are expected to result in the largest low-grade copper mine in the world are being built there at a cost of more than $100,000,000. The new town, which will contain homes for 1,500 families, is being planned and built by the Del E. Webb Construction Co.

CALIFORNIA—

CONSTRUCTION IN California during the first 11 months of 1953 reached a new high, as exemplied by the record $402,193,750 worth of new construction in Los Angeles. This compares with a total of $316,494,600 for the same period last year.

More of the same may be expected for 1954, if the $8,000,000 expansion program planned by the Kaiser Steel Corp., at its Fontana plant and the $7,500,000, 1,000-bed addition to the Naval hospital in San Diego are any indications.

A banner construction year in the northern end of the state is also indicated by the following proposed or already started projects. Citizens of Oakland approved a $10,000,000 bond issue for improvements at the Oakland Airport. These include construction of a new passenger terminal building, runway extensions, additional parking areas, and a highway connecting to the Eastshore Freeway. In addition, the city's Board of Education is seeking support for a $34,317,000 bond issue to eliminate earthquake hazards and provide new buildings.

Industrial expansion for 1954 in Alameda County, of which Oakland is the county seat, includes a total of $2,289,000 set aside by the East Bay Municipal Utility District for reservoir, pipeline, and miscellaneous construction.

Other industrial construction which is currently under way in Alameda County includes a 30-ac. site in San Leandro on which the Western Electric Co. will construct a distributing warehouse, shops, and office buildings with a total floor area of 390,000 sq. ft. at a cost of $4,700,000.

General Motors Corp. is expanding two of its facilities in Oakland at a cost of $1,380,000. This includes a 114,000-sq. ft. warehouse and an addition of 16,000 sq. ft. to the Chevrolet assembly plant. Completion has been set for early 1954.

Construction is scheduled to start soon on an 85,000-sq. ft., one-story concrete warehouse in Oakland for the California Packing Corp. Three new machines will be added to the new can plant at a cost of $1,000,000.

Some 128 firms either started new enterprises or expanded their previous operation during the first 10 months of 1953 in Alameda County at a total cost of $14,445,000.

Highway construction in Alameda County will continue at a rapid pace during the first half of 1954 with a budget allocation of $2,112,000 for roads and bridges. An additional $811,750 will be spent on local streets within various communities of the county. For the whole of 1954, Alameda County will have more than $17,000,000 to spend as its apportionment of state highway funds.

The City of Oakland will spend about $4,700,000 in the next fiscal year for improvements and maintenance of city streets.

New industrial plants and expansion of old plants in the 12 counties of the Greater San Francisco Bay Region during the first half of 1953 were built at a total investment of about $169,052,700. Among the larger plants which were completed during 1953 or are still under construction are an automotive assembly plant of

the Ford Motor Co. at Milpitas, an airplane maintenance building for United Airlines at South San Francisco, plant expansion by the American Can Co. in San Francisco, a Union Oil Co. plant at Oleum, a food processing plant for Safeway Stores, Inc. at Richmond, and plant expansion at the Falstaff Brewing Co. facility in San Jose.

Industrial construction in San Francisco is typified by a 25-story building, which will have about 360,000 sq. ft. of floor space, for the Equitable Life Assurance Society being built by Dinwiddie Construction Co. under an $11,000,000 contract. The foundation is being built by Raymond Concrete Pile Co.

Highway construction in San Francisco County, mostly freeway structures, for the fiscal year starting July 1, 1954, is expected to reach $14,130,000. The eight nearby counties of Alameda, Contra Costa, Marin, Napa, San Mateo, Santa Clara, Solano, and Sonoma will spend about $37,712,000 during the same period.

COLORADO—

COMMERCIAL AND INDUSTRIAL construction in Denver during 1953 is expected to exceed $95,000,000. This figure was reached by an evaluation of building permits issued during the year. The sum exceeds by far the previous record year for city construction, 1951, when $75,257,000 worth of permits were issued.

Building construction which is now under way or proposed for 1954 starts in downtown Denver seems to run to tall buildings. These projects include the Petroleum Building, 15 stories; Mile High Center, 23 stories; Denver Club Building, 23 stories; Farmers Union Building, 10 stories; Statler Hotel, 30 stories; a Sears-Roebuck retail store and warehouse; and a 1,500-capacity theatre. The Statler Hotel, construction on which will start in June 1954, and the Mile High Center will be constructed by Webb & Knapp. Murchison Brothers is building the Denver Club Building.

Public buildings currently under construction include a new airport ticket wing, two off-street parking buildings, and renovation of the city auditorium. These projects will cost about $2,269,000.

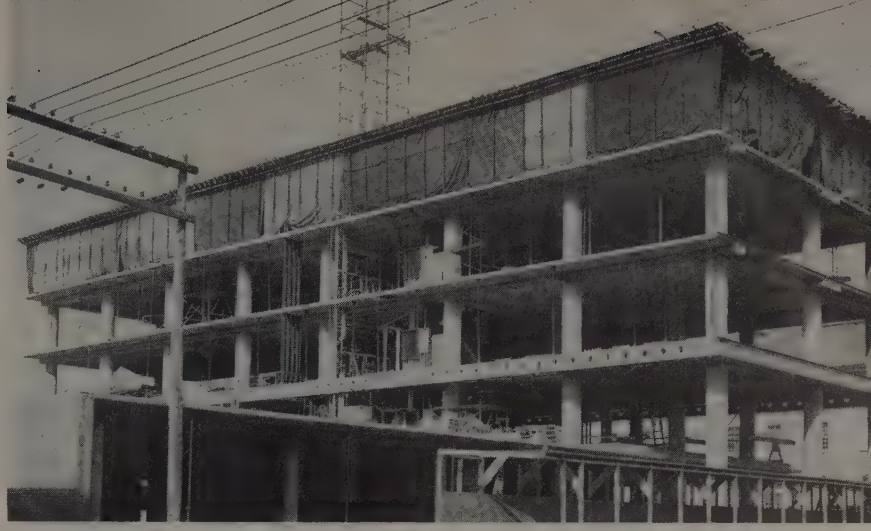
Proposed construction for 1954 includes additional off-street parking buildings, a new library, a new jail, and an administrative building at the airport at a total cost of $6,450,000. Proposed paving, sewerage, bridge, and lighting projects will cost $2,547,000.

IDAHO—

MOST OF the private construction in Idaho is concerned with home, school, and small business building. For example, a new $240,000 grade school is under construction in Idaho Falls with completion date set for September 1, 1954. School house construction is becoming a very important part of the picture in the West. A single project, such as this, may not loom large, but throughout the 11 Western states schools mean a lot of work for Western contractors

Two construction concerns, J. A. Terteling & Sons, Inc. and Morrison-Knudsen Co., Inc., are engaged in phosphate mining in the Soda Springs-Montpelier area.

A major source of construction work is the National Reactor Testing Station at Idaho Falls, run by the Idaho Operations Office of the U. S. Atomic Energy Commission, which has building projects either under construction or up for bid very often.



GOING UP in Albuquerque, New Mex., is the new 12-story Simms Office Building, the tallest in the city. It will contain 132,000 sq. ft. of floor space. Plans for the air-conditioned structure were prepared by Max Flatow and Jason Moore, architects.

MONTANA—

INDUSTRIAL CONSTRUCTION in Montana is expected to continue on the same high level in 1954 it reached during 1953. Projects now under construction or definitely scheduled for 1954 starts include an aluminum plant at Columbia Falls, intended to process aluminum ingots and wire and sheet aluminum, at a cost of about $45,000,000. This plant is being built for the Anaconda Copper Mining Co. Construction has started on a new telephone building for the Mountain States Telephone & Telegraph Co. in Helena. It is expected to cost about $500,000,

Projects planned for 1954 include a state laboratory building, to cost about $900,000, a high school at Helena to cost about $1,000,000, and a junior high school at Butte also to cost about $1,000,000. Other plans exist for a new bank building and two office buildings in Billings and numerous schools throughout the state. An increase in building construction after the first of the year is expected by the Montana Contractors' Association, Inc., a chapter of the AGC.

Other projects scheduled for 1954 include a hospital and dental clinic at Great Falls Air Base, several buildings and concrete parking aprons for the Montana Air National Guard at Great Falls Municipal Airport, and another building at the Great Falls plant of the Anaconda Copper Mining Co., to be used in connection with Anaconda's primary aluminum production plant at Columbia Falls.

NEVADA—

NEVADA'S INDUSTRIAL and commercial construction program in 1953 totaled $2,580,000 for new construction with an additional $2,664,000 in additions and betterments. Plans for 1954 call for a whopping $15,500,000 in new construction and $1,000,000 in additions and betterments.

There were ten large construction jobs under way in 1953 which will be carried over into the early part of 1954. The total value of the building permits for these jobs amounts to $5,244,000.

Plans for 1954 include a students' union building at the University of Nevada for $450,000, five hotels and motels to be built for a total of $10,550,000, and various industrial additions and betterments to the sum of $1,000,000.

All of the above mentioned construction is in Reno and Sparks. Residential construction in Sparks is expected to amount to $1,500,000. Residential construction in Reno is expected to reach $3,000,000.

NEW MEXICO—

NEW MEXICO'S industrial and commercial building can be typified by what is going on in Albuquerque, the largest city in the state. Building permits for the first 11months of 1953 amounted to $33,300,000, $100,000 more than the previous record high

for all 12 months, set in 1950, and it looks even better for 1954. This prediction is based on the almost $20,000,000, worth of building construction either currently in progress or soon to be started. This total does not include a general laboratory and administration building for the Atomic Energy Commission at Los Alamos, put out for bid in December. Estimated cost of construction on this project ranges between $3,500,000 and $4,500,000.

The bulk of this private construction includes homes, schools, super markets, small industries, and miscellaneous buildings. Among the larger projects are the 12-story Simms Office Building under construction by Lembe, Clough, & King at an estimated cost of $1,500,000.

Other major projects now under way include the North Valley Senior High School, being built for $1,055,800 by Lembe, Clough, & King, and improvements at the Albuquerque sewage treatment plant. Low bid on this job was $1,141,725, but the contract had not been awarded at the time of this report.

OREGON—

INDUSTRIAL CONSTRUCTION in Oregon has remained high for 1953 and the total is expected to be considerably above 1952 when all reports are in, according to the Portland Chamber of Commerce.

A major project in Oregon is a $750,000 warehouse for Fred Meyer, Inc., in Portland. This is a one-story building which contains 180,000 sq. ft. Its concrete walls were built with the tilt-up method and it has a wood truss roof. This structure, completed in November 1953, was built by Anderson & Westfall Co.

The other project mentioned is a grocery warehouse being built for United Grocers, Inc., in Lake Grove at a cost of $1,000,000 by Waale-Camplan Co. This is a reinforced concrete building with wood truss roof. It contains 120,000 sq. ft. and is 275 ft. wide and 396 ft. long.

STEEL FRAMEWORK goes into place on the Aluminum Co. of America's new $3,360,000 extrusion mill at Vancouver, Wash. The plant will contain 80,000 sq. ft. when finished.

UTAH—

INDUSTRIAL CONSTRUCTION in Utah has been booming along on a high plane during 1953. This was revealed by the total of some $83,300,000 allocated for construction or improvement of large plants and other facilities all over the state. These facilities have either just been completed, are now under construction, or will soon start.

For example, Utah Power & Light is spending $26,000,000 on an additional unit at its Gadsby Plant at Salt Lake City and a new unit in Carbon County. Union Pacific Railroad is constructing servicing facilities at North Salt Lake at a cost of about $6,000,000. Western Phosphates has completed an installation for production of fertilizer at Garfield at a cost of $5,000,000. Columbia-Geneva Steel Division has completed improvements to expand its operations at a cost of about $5,000,000. Utah Natural Gas has completed a pipeline from the Clear Creek gas fields to Provo at a cost of $5,000,000. Mountain Fuel Supply is spending $10,000,000 for expansions of its lines and facilities. And the Pioneer Pipeline Co. has completed its oil line from Sinclair, Wyoming, to Woods Cross, Utah, at a cost of $8,500,000. This list could go on indefinitely in varying amounts.

Plans for 1954 look good also with some $30,500,000 already tabbed for new construction. Included in this sum are plans by General Motors to build a diesel engine servicing plant near Bountiful at a cost of $1,500,000, plans to build a $9,000,000 ammonia plant in the Salt Lake area by the Salt Lake Chemical Co., and plans for another ammonia plant in south central Utah at a cost of $21,000,000 by the Utah Chemical Co.

WASHINGTON—

BUSINESS IS BOOMING in commercial and industrial construction in the state of Washington. Major projects either under construction or completed in 1953 include more than $16,000,000 worth of work at the Boeing Aircraft Corp., construction totaling more than $131,000,000 at the shipyards in Seattle, the new Kaiser Gypsum plant valued at $4,100,000, the expansion of the I. Magnin & Co. department store, being built by the General Construction Co. for more than $3,000,000.

Among the many structures under construction in Spokane are a $1,000,000 bank and a public auditorium, being built at a cost of $1,787,700. Henry George & Sons holds the contracts for both of these projects. In addition, storage facilities are being built in Spokane by The Chicago Bridge & Iron Co. for $1,000,000.

Additional major projects under way are the Box Canyon Dam at Ione, being built by Pacific-General-Shea at a cost of $17,000,000 and, the Yellowstone Pipeline, being built in four sections at a cost of $20,000,000, which runs from Billings, Montana, to Spokane.

Vancouver is represented by a project to build additions to the aluminum reduction, rod and bar mill, and transmission cable plant of the Aluminum Company of America. Cost of these structures amounts to $3,390,000. In addition, a new extrusion plant is being built at a cost of $3,360,000. Also in Vancouver is a grain elevator addition, being built at a cost of $1,800,000 by Henry George & Sons. Completion date is May 1954.

Plans for 1954 in Washington include expansion of Ross Dam and start of construction on Gorge Creek Dam for expansion of the Skagit Power Project at a cost of more than $25,000,000. The Washington State Department of Fisheries has proposed two new fishways, one at Granite Falls on the Stillaguamish River and one on the Deschutes River. These two fishways are expected to cost several million dollars.

A building permit for $2,900,000 has been issued for the proposed expansion of the Bon Marche operation in Seattle, and the Union Pacific Railroad is planning to build a new terminal in Spokane, complete with maintenance facilities, at a cost of $2,755,000.

WYOMING—

WYOMING'S PLANS for construction in 1954 seem to run mostly to the exploitation of natural resources. This is reflected in the increasing interest in exploration for uranium deposits which provide the raw material for atomic energy. A committee of Wyoming officials has asked the U. S. Geological Survey to declare part of western Natrona County an area of first priority for uranium exploration. Other potential activity exists in the oil fields of the Powder River Basin, where extensive test drillings are being carried out.

Proposed industrial construction in the state includes plans for a $200,000 gasoline plant to be built in the Hay Creek area of Weston County for Lakota Petroleum Corp. Other proposed construction includes a soil laboratory and research station for Fremont County and a natural gas pipeline to be constructed by the Pacic Northwest Pipeline Corp., if the Federal Power Commission approves the company's application.

WELDING for the repair and strengthening of bridges

Time and costs can be reduced in the repairing and altering of old steel bridges through the proper application of welding techniques — Needed: preliminary training and effective supervision of field forces to achieve these possibilities

WELDING is an invaluable aid in repairing, strengthening and altering steel bridges. It happens that dynamite is also a very useful construction tool. Welding and dynamite are dissimilar in most respects, but they are similar in one important way. They are both very dangerous unless properly used. The disastrous effect of improper handling of dynamite is instantly obvious, whereas the failure of poorly executed welding may not occur for years.

The proper use of welding involves design, materials, welding procedures and workmanship—and this proper use can effectively reduce the costs of repairing, strengthening and altering steel bridges. Typical applications in this field are described in the first part of this article, along with illustrations and drawings.

However, unless all of the phases of welding are competently handled, other methods should be preferred because they are more fool-proof even though more expensive and more time consuming. The risks of shoddy welding work, and the ways that it can be prevented, make up the second half of this article.

Repairing damage

In maintaining the steel bridges of the Texas highway system, the old through-truss spans present most of the repair problems. This is emphasized by the fact that many such spans are left in place when the department accepts existing county roads to add them to the system of state highways. Many of these bridges are strong enough to carry the trucks which use the highways. But the clearances, both overhead and back of the curb, are not great enough to keep loads from striking parts of the structures. The portals, sway frames and truss members were not designed for such blows and are often damaged to the extent that the strength of the span is severely lowered.

Adequate overhead clearance can be provided by modification of the portals and sway bracing, preferably before a high load has struck them with further damage to the truss members themselves. In many instances the removal of kneebraces in these frames is possible and is a partial cure. In some cases the lower portion of the frames must be removed and replaced by similar pieces several feet higher. This is likely to be the case in long spans with deep portals and sway frames.

By PERCY V. PENNYBACKER
Supervising Field Engineer
Bridge Division
Texas Highway Department
(Recipient of the "Dr. L. I. Hewes Award" for 1953)

In short truss spans the Texas Bridge Division has developed a "horse-collar" portal (see illustrations) which offers no encroachment between the trusses and below the top lateral bracing. This calls for leaving and stiffening the top strut of the sway frames and removing their lower portions. The new portal is a rigid frame which is prefabricated but is field installed by welding.

The "horse-collar" modification is obviously a matter of design, although Texas practice is for the design to make use of old material available from the nearest district warehouse yard. The design and detailing of such modifications are easier if shop drawings are available of the old steel structure, and the construction is not unduly complicated if the designer has enough field experience to know what men and equipment can do.

Repairing by heating, forcing and welding

When the web members of a truss are damaged by a high load hooking a sway frame the member which suffers injury is generally a vertical compression member. Sometimes the damaged portion of such a member is removed and replaced with new material. This necessitates carrying

AGAIN, the Dr. L. I. Hewes Award has been presented to an oustanding highway engineer by the Western Association of State Highway Officials. Thus does WASHO commemorate the man who represented the Bureau of Public Roads in this Western region during a long and distinguished career.

Sponsored and financed by this publication, the 1953 presentation of the award goes to P. V. Pennybacker, a bridge engineer who has imaginatively and economically adapted welding to the repair and strengthening of highway bridges in the West.

With available highway revenues badly strained by demands for more and better roads, all economical engineering measures which add life and utility to existing structures are important. In this article Mr. Pennybacker outlines for bridge engineers throughout the West his welding designs and practices, developed to increase the service life of steel structures.

For the record — last year the $500 Hewes Award was divided between two recipients, Herbert W. Humphres, district soils engineer, Washington Department of Highways, and James T. McWilliam, assistant engineer, California Division of Highways.—*Editor.*

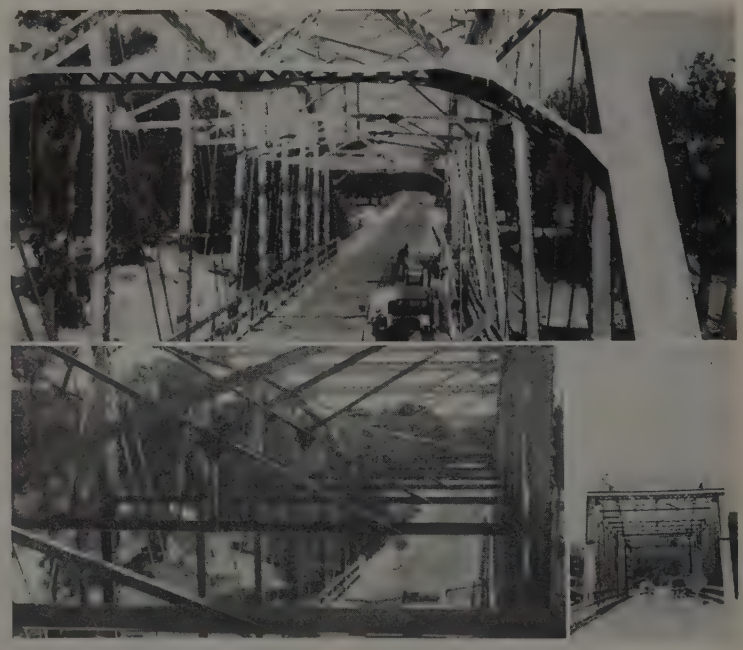
Texas bridge repair case histories

1—Increasing through-truss vertical clearance

IN MANY OLD through-truss bridges the clearance diagram permitted kneebraces to narrow overhead clearance to about half the roadway width. If these truss spans are relatively short, the condition can be corrected by replacing the present portal and sway bracing by a new arrangement which does not exist below the elevation of the top of the truss. Examples are shown as follows:

TOP LEFT—A very old structure with the first "horse-collar" portal, made of an I-beam, fabricated with a cutting torch and arc-welded in place. TOP RIGHT—Truss span 120 ft. long, with kneebraces removed from the portal and sway bracing. BOTTOM LEFT—Companion to the one shown at top right. New system of bracing has been installed, not yet painted. The portal is made of three pieces of channel. The small angles are an incidental extra. BOTTOM RIGHT—Top struts of bridge shown at bottom left reinforced by the addition of light beams before the sway frames were removed.

2—Repairing damage by heating, forcing and welding



LATE IN 1953 this bridge was damaged by an overheight load. Columns on both sides were bent in and the wind bracing was damaged. For repair the web members were straightened and the portals and sway frames were rebuilt to provide greater vertical clearance.

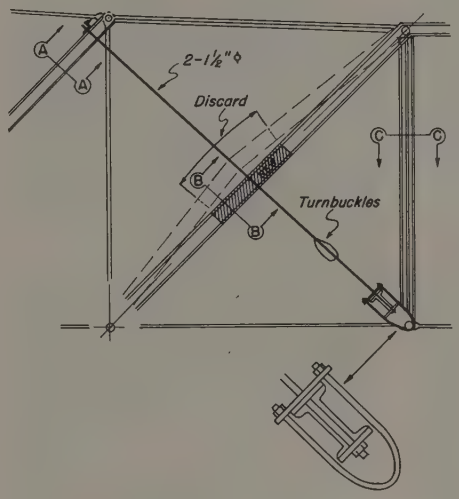
The columns were straightened in place by heating and jacking with due control. Damaged metal was reinforced by welding. The wind bracing was raised, using welded connections. Vertical clearance was increased at the portals, with metal cut to fit in the field and all connections welded.

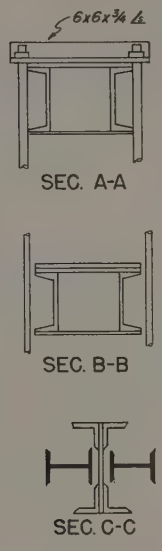
TOP—View showing columns bent on both sides and damaged wind bracing. BOTTOM LEFT—After repairs and before final painting. Wind bracing raised. Lower strut stiff enough to figure for these sway frames. BOTTOM RIGHT—Portal after increasing vertical clearance and before painting.

3—Repair of damaged end-post in suspended span of cantilever bridge

THE DRAWINGS illustrate the method used in the removal of a damaged end-post in the suspended span of a cantilever bridge and insertion of a new piece by use of welding where other methods would have taken longer and cost more.

This was a very old span carrying a timber floor. The end-post was crippled very badly during 1944 when both time and metal were short. The drawings show how the repair was made with the only new material used being one short piece of 6x6x¾-in. angle, two 1½-in. turnbuckles and some 1½-in. nuts. The plate and 7-in. channels were from scrap and the 1½-in. rods were in stock from World War I surplus. They were spliced by welding to make the required lengths. The method of repair eliminated the need for high falsework in the river, and only hand labor was required.





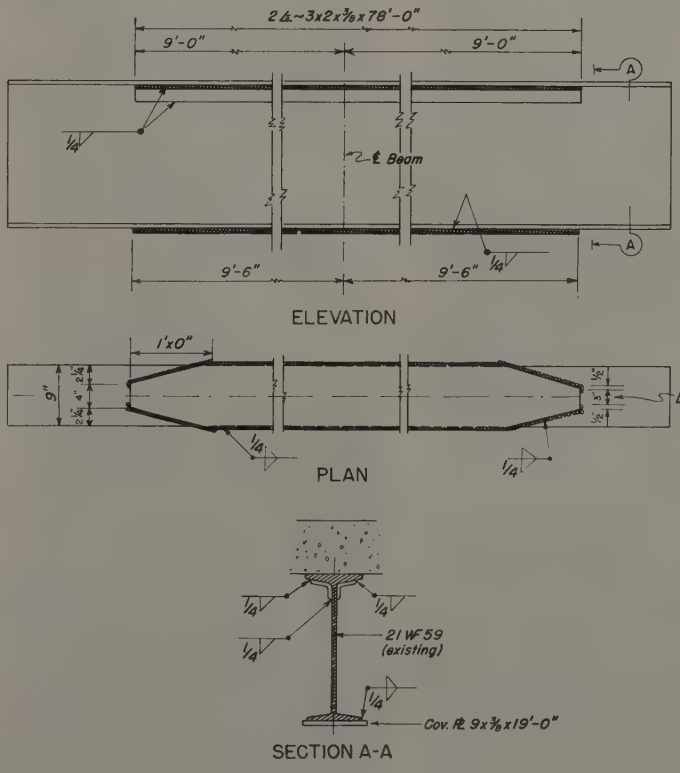
The steps in the repair were as follows: (1) Weld tie to balance horizontal component of stress in turnbuckle rods. (2) Remove three panels of floor. (3) Stiffen hanger to make it good for compression. (4) Install turnbuckle rods and lift truss to proper elevation, stopping to (5) remove damaged part of end-post as soon as all weight is on turnbuckle rods. (6) Install new section of end-post. This was fabricated of scrap metal by welding and was installed by welding.

4—Strengthening of existing simple beam spans

THE STRENGTH of existing simple beam spans is being increased during widening by adding flange metal, as shown here. In these relatively short spans no effort is made to have the new metal share in the dead load stress.

The sequence of welding is as follows: TOP FLANGE ANGLES—Tack throughout and weld from centerline toward ends, backstepping and alternating on each in approximately 12-in. steps. BOTTOM COVER PLATES—Tack throughout and weld 12 in. on each side of each end and backstep remainder as above, welding toward center. Bottom cover plates to be welded before angles.

Note that in Section A-A, the heel of the angle should be ground to fit fillet and the legs should be spread to fit the slope of a Bethlehem beam.



the stress, which the post would normally bear, on a temporary post equipped with a jack so the top and bottom chords can be jacked apart to proper dimension (they came closer together when the post was bent). Occasionally the damaged member is straightened by heating and forcing. Because the member is carrying its stress of the dead load of the truss span during this operation, this should be undertaken only after the designer has done the necessary "arithmetic" to vouch for the safety of the proposed method. Design and field know-how must walk arm-in-arm for repairs of this nature.

Accompanying pictures illustrate a recent job handled by the Beaumont District of the Texas Highway Department where the web members were straightened and the portals and sway frames were rebuilt to provide greater vertical clearance.

Another example, with the method shown in accompanying drawings, involved the removal of a damaged end-post in the suspended span of a cantilever bridge and insertion of a new piece by use of welding where other methods would have taken longer and cost more.

Increasing strength

During the widening of existing simple beam spans, strengths have been increased by the addition of flange metal. This method is shown by accompanying drawings. In these relatively short spans no effort is made to have the new metal share in the dead load stress. (This has been done and is an interesting detail.)

Controlling the product

Methods such as the foregoing are recommended only if the welding is done properly. The need for educational work on this still-mysterious process of joining metals is tremendous. The technical features of welding are no more difficult than for many other construction processes. But the requirement of constant attention to detail by all supervisory personnel is possibly greater for welded work. When engineers recognize the possibilities of welding for bridges, and also the risks of shoddy welding, they should design for welding and then provide for proper supervision.

Welding in truss span erection

Welding will probably never replace rivets for the field connections of truss spans. The economy of established erection methods prevents such substitution. Welding is not a cure-all. In deciding upon the design and its details the engineer should be able to apply proper evaluation of all types of concrete construction and all types of steel construction. Welding is included in the latter.

Engineers are properly concerned about the quality of work which will complete the structure representing their designs. We will assume they have fundamental knowledge of the factors of metallurgy and mechanics which have controlled the decisions of the committee writing the American Welding Society's Specification for Design and Construction of Railway and Highway Bridges. Because welding is such a rapidly progressing science, and because it is still such a complete mystery to most of the people who can benefit from its full use, this specification is largely an explanatory manual or primer, unlike specifications for long established and generally understood processes.

Proper welding procedure

Let us assume that the design is good, that the metal is of proper quality and well fabricated, and that the welders are honest and competent operators. In any except the simplest work done under favorable conditions the resulting product may vary widely in quality. The welding procedure which is followed governs this. Welding procedure covers these features among others: (a) quality of the base metal, mild steel, wrought iron, rail steel, etc., (b) preparation of the base metal for welding, fillet or groove weld, cleanliness of metal surface, smoothness and regularity of metal surface, (c) the position in which the welding is to be done, flat, horizontal, vertical, or overhead, (d) the electrode to be used, type and size, (e) the current and voltage settings on the machine, (f) the type of current, ac., dc. straight polarity or dc. reverse polarity, (g) is preheat required for the temperature at which the work is to be done, (h) sequence of beads deposited and direction in which run, and (i) the size of each bead run.

The supervisor must be able to set up a proper welding procedure. The inspector must be able to see that it is followed. The foreman should understand why a procedure is important. And the more the welder himself understands all that is involved the better craftsman he is. There are about as many variables to be controlled in producing portland cement concrete or asphaltic concrete and there is no justification for the general lack of knowledge about welding on the part of the industry's supervisory personnel.

X-ray inspection

Unless the work is X-rayed the welder is the only man who knows first hand the true quality of his work. A competent inspector can know about that welding which he watches through a shield. X-ray inspection of structural welding is not practical nor is it necessary. Satisfactory work is assured, following development of a welding procedure, when the welder is both capable and conscientious and is encouraged to do good work. The foreman and inspector are both involved in that last item.

Testing fillet welding

Most of the bridge welding involved in repair and alteration work will be fillet welding. It is apt to require proficiency in all positions. And two types of electrodes will probably be used. Field tests, supervised by a competent inspector, are adequate to convince both inspector and welder regarding the latter's ability to do good work of this type. The best test is the standard fillet-weld break test (see drawing). The test specimens should be made in both the vertical and overhead positions using the electrode which will be used on the work. The surface of the weld is examined for quality. This may be bad enough to disqualify the welder. If the surface is satisfactory the weld is broken and visually examined. This tells the story of fusion, penetration, inclusions and porosity in a manner which can not be denied. This test is based on the accepted assumption that sound welds of proper size with standard electrodes will serve satisfactorily. It will tell whether or not a man can do good work. Whether he will consistently do so is the inspector's responsibility.

There are other type tests, requiring laboratory equipment, for judging fillet welds. But if the inspector on the job is not able to supervise and judge the fillet weld break test he is

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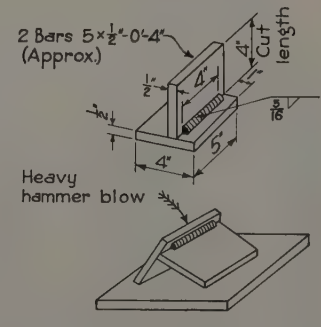
THE SOUNDNESS TEST



THIS TEST was developed by the American Bridge Company for examining the qualifications of welders. It is used when a qualitative test is acceptable. The specimen is welded as indicated and then broken by a hammer blow. Visual examination of the weld and its fracture readily reveals any improper fusion between the weld and base metal or lack of soundness. A four or five power glass aids in making the visual examination.

Welders are required to make specimens in each of the positions which will occur on the work to be welded.

Hydro power projects of the future

DURING recent years, the Federal Power Commission at its regional office in San Francisco has received applications for a large number of proposed hydroelectric projects. Applications have been received from private power utilities, municipalities, and public districts. The present status of each of these major projects for which applications have been received is described below.

Lesher S. Wing is regional engineer of the Federal Power Commission in San Francisco.

NON-FEDERAL agencies—private or public—planning a hydroelectric development normally make their initial move through an application to the Federal Power Commission. Control on government lands, including sites for dams, reservoirs or access roads, makes FPC approval of these plans mandatory.

Files of the FPC San Francisco office include such preliminary data on the applications that represent construction projects of the future. The major hydro programs reaching the study stage are briefed or brought up to date in this summary.—*Editor.*

Tacoma on Cowlitz River

A 50-year license has been issued to the City of Tacoma, Wash., for a hydroelectric project on the Cowlitz River. The Commission conditioned the authorization to require the city to make further tests and experiments, and to obtain FPC approval, before constructing any permanent fish handling facilities or fish protective devices. The proposed project, which has attracted widespread public interest because of the controversy over its fish passage facilities, will include two dams. One, to be built near Mossyrock, Wash., will be about 510 ft. high and 1,300 ft. long at the crest. A powerhouse, at the toe of the dam, will contain three 75,000-kw. units, with provision for a fourth. The other dam, near Mayfield, Wash., will be 240 ft. high and have a crest length of 350 ft. The powerhouse will have an initial installation of three 40,000-kw. units with provision for a fourth. The issuance of this license has been approved by the Ninth Circuit Court of Appeals.

Portland G.E.'s Round Butte Project

Portland General Electric Co. of Portland was granted a two-year preliminary permit for a proposed development in Jefferson County, Ore. The development, known as the Round Butte project, would be located on the Deschutes, Metolius and Crooked Rivers, upstream from the company's Pelton project, for which it recently received a license from the FPC. The project would include a concrete gravity type dam on the Deschutes River. The proposed powerhouse, to be located immediately downstream, would have an installed capacity of 310,000 hp.

P. G. & E. on the Feather

Pacific Gas and Electric Company has been issued a 50-yr. license for its Poe hydrolectric project on the North Fork of the Feather River in Butte County. The proposed project, which has a total estimated cost of $40,490,000, is a part of the company's planned comprehensive scheme of development of the power resources of the North Fork of the Feather River. Water would be diverted through a 33,700-ft. pressure tunnel connected to two welded steel pipe penstocks extending approximately 780 ft. to the powerhouse, which would have an installed turbine capacity of 146,000 hp.

Big Horn in Montana

The FPC has postponed, until further order, further consideration and action on an application by the Big Horn Canyon Irrigation & Power Co., of Hardin, Mont., for a preliminary permit covering a proposed hydroelectric project on the Big Horn River in Montana and Wyoming. One of the issues in the proceeding is whether the FPC has jurisdiction to issue the requested permit in view of congressional action authorizing the construction of the Yellowtail Dam at approximately the same site.

Portland G. E. on Pelton Project

A 50-year license has been issued, conditioned to conserve the fishery resources of the Deschutes River, to Portland General Electric Co., of Portland, for the proposed Pelton project in Jefferson County, Oregon. The Commission said that the project, which will have a dependable capacity of 108,000 kw., is probably the most readily available source of new power supply in the Pacific Northwest since only two years will be required to put the plant into operation. The project, estimated to cost approximately $22,070,000, includes a 205-ft. concrete arch dam; side channel and tunnel spillway; 3 short penstocks; an outdoor type powerhouse, located immediately downstream from the dam, containing three 52,000-hp. turbines connected to three 36,000-kw. generators; a 7-mi., 230-kv. transmission line; and a reregulating dam. Total cost of the project includes $4,430,000 which the company will spend for the reregulating dam and other fishery conservation facilities. Conflict with fishery interests has prevented this project from being constructed.

Richvale on the Feather

Richvale Irrigation District has applied for a 24-mo. preliminary permit for a proposed hydroelectric project in the Middle Fork of the Feather River in Plumas and Butte counties in California. This development would have a total capacity of about 252,000 hp. or 189,000 kw., according to the application. The project would include two large dams across the Middle Fork of the Feather River, a series of four diversion dams, tunnels totaling about 23.4 mi. in length, penstocks, and five powerhouses.

Grant Lake in Alaska

Grant Lake Electric Power Co., Inc., of Anchorage, Alaska, has applied for a preliminary permit for a proposed hydroelectric project on Grant Creek and Grant Lake on the Kenai Peninsula of Alaska. The project would include a concrete dam at the outlet of Grant Lake and a 5,000-ft. conduit extending to a powerhouse on Grant Creek. The powerhouse would have an initial installation of 2,000 hp., with provisions for increasing the installed capacity to 4,000 hp.

Washington P. U. D. at Box Canyon

The Commission issued a 50-year license to Public Utility District No. 1 of Pend Oreille County, Wash., for its proposed Box Canyon hydroelectric development on the Pend Oreille River. The project will include a dam about 260 ft. long at the Box Canyon site, north of Ione, Wash., forming a reservoir extending upstream 55 mi. to the Albeni Falls Project of the Corps of Engineers. The powerhouse will contain four vertical turbine-generator units, each of 24,500 hp. This project is now under construction.

P. U. D. on the Packwood Project

The preliminary permit issued to Public Utility District No. 1 of Lewis County, Wash., for a proposed project near Packwood in Lewis County has been extended to February 28, 1955. The development, which has been designated the Packwood Project, would include: (1) a dam on Johnson Creek, with flume for the diversion of water from Glacier Creek; a forebay and penstocks; and powerhouse with ultimate installed capacity of 45,000 hp.; (2) a dam on Lake Creek at the outlet of Packwood Lake; tunnel, pipeline, surge

Continued on next page

HERE ARE THE MAJOR CONTRACTS AWARDED IN WEST DURING 1953

ALASKA

L. E. Baldwin, Inc.—Housing at Elmendorf	$ 5,844,300
S. Birch & Sons and Lytle & Green—Alaska Highway	2,196,720
S. Birch & Sons and Lytle & Green—Airfield paving at Elmendorf	7,230,325
J. C. Boespflug Construction Co.—Hospital at Elmendorf	8,364,970
Ben C. Gerwick, Inc.—Control tower and utilities at Kodiak Naval Base	2,786,000
Peter Kiewit Sons' Co. and Fred J. Early, Jr., Co.—Training facilities at Big Delta	12,328,224
Lease & Leigland and M-B Contracting Co.—Furnishing concrete, aggregates and grout at Ladd	5,422,540
Lease & Leigland and M-B Contracting Co.—Utilities at Ft. Richardson	2,796,073
S. Macri Construction Co.—Paving at Elmendorf	2,642,090
Manson Construction & Engineering Co. and Osberg Construction Co.—Beaver Falls hydroelectric expansion	2,629,361
Morrison-Knudsen Co., Inc.—Richardson Highway	2,543,755
Morrison-Knudsen Co., Inc.—Paving at Eielson	2,560,570
Morrison-Knudsen Co., Inc.—Airfield paving at Eielson	4,525,825
Morrison-Knudsen Co., Inc.—Richardson Highway	2,089,000
Patti-MacDonald Construction Co., Wyatt & Kipper Engineers, Inc., and Thoraugard Plumbing & Heating—Powerhouse at Elmendorf	11,514,006
Patti-MacDonald Construction Co.—Housing at Ft. Richardson	5,620,703
Williams Bros. Construction Co., McLaughlin, Inc., and Marwell Construction Co.—615-mi. oil pipeline	29,001,281

ARIZONA

Fisher Contracting Co.—Apron paving at Luke AFB	782,110
Fisher Contracting Co.—Water mains in Phoenix	2,457,020
R. H. Fulton & Co.—Gas pipeline from Topock to Las Vegas, Nev.	2,217,500
Peter Kiewit Sons' Co.—Mohawk Distribution System	1,682,675
Morrison-Knudsen Co., Inc.—Dome Canal and distribution system	1,990,791
Morrison-Knudsen Co., Inc., and R. A. Westbrook—Apron and taxiway at Davis-Monthan AFB	2,368,478
Vinnell Co., Inc.—Ashfork-Flagstaff highway	586,452
Wallace & Wallace—Highway 70 mi. north of Phoenix	564,680

CALIFORNIA

Vido Artukovich & Son, Inc., and Papac Construction Co., Inc.—La Cienega and San Fernando Valley relief sewer	1,333,059
Arundel Corp. and L. E. Dixon Co.—La Cienega and San Fernando Valley relief sewer	3,167,710
Guy F. Atkinson Co.—Cherry Valley Dam	7,162,800
Guy F. Atkinson Co.—Grading and tunnel near Golden Gate Bridge	4,122,382
Guy F. Atkinson Co.—Flood control in Los Angeles	1,728,775
Guy F. Atkinson Co.—Wharf at Long Beach	1,199,215
Austin Co.—Manufacturing plant at Newark	2,500,000
T. C. Bateson Construction Co.—Hangar and paving at Castle AFB	3,258,046
C. F. Braun & Co.—Synthetic ammonia plant at Brea	13,000,000
Coast Pipeline Contractors—Feeder pipeline at Los Angeles	1,519,700
John Delphia—Peters Dam	1,439,530
Fredrickson & Watson Construction Co. and M & K Corp.—Sly Park Project	2,488,885
Fredrickson & Watson Construction Co. and M & K Corp.—Highway in Contra Costa County	1,451,980
General Electric Co.—Steam generator unit, Valley Steam Plant	3,896,180
Ben C. Gerwick, Inc., and Peter Kiewit Sons' Co.—Substructure, Richmond-San Rafael Bridge	14,234,550
M. H. Golden Construction Co.—Naval training facilities, San Diego	2,114,000
Griffith Co.—Golden State Freeway	3,060,396
Grove, Shepherd, Wilson & Kruge—Electric-electronics shop, Mare Island Naval Shipyard	4,800,000
Chas. L. Harney, Inc.—Bayshore Freeway	3,680,237
Harvey & Rose—Housing project at Los Angeles	2,645,000
S. A. Healy Co.—Second barrel, San Diego Aqueduct	6,798,100
Judson Pacific-Murphy Corp.—Bracing for Golden Gate Bridge	3,062,215
Peter Kiewit Sons' Co.—Eastshore Freeway	4,387,774
Peter Kiewit Sons' Co.—Superstructure, Richmond-San Rafael Bridge	21,099,320
Peter Kiewit Sons' Co.—Naval fuel facilities, Point Loma and Miramar	2,145,245
Peter Kiewit Sons' Co. and Fred J. Early, Jr., Co.—La Cienega and San Fernando Valley relief sewer	2,082,965
Peter Kiewit Sons' Co. and Parish Bros.—Monticello Dam	7,628,991
C. H. Leavell & Co.—Marine training facilities, Camp Pendleton	1,625,575
R. V. Lloyd & Co.—Irrigation facilities, Friant-Kern Canal	2,606,538
Macco Corp.—Two bridges in Long Beach	1,518,245
Robert E. McKee, General Contractor, Inc.—Hospital at Los Angeles	3,665,100
Robert E. McKee, General Contractor, Inc.—Housing at Los Angeles	7,057,000
Robert E. McKee, General Contractor, Inc.—State hospital at Vacaville	2,875,900

Tabulation continued on facing page

POWER PROJECTS

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tank, and penstocks; and powerhouse with ultimate installed capacity of 30,000 hp. on Snyder Lake; (3) a dam on Snyder Creek at Snyder Lake and a canal from Snyder Lake to the Johnson Creek forebay.

Washington W. P. Co. on Clark Fork

The Commission issued a preliminary permit to The Washington Water Power Company, of Spokane, for a project on the Clark Fork River in Sanders County, Mont. This project is now producing power. The development, known as the Noxon Rapids project, includes a concrete dam at the Noxon Rapids site, a powerhouse with an installed capacity of 197,000 hp. with provision for additional capacity; and a 230-kv. transmission line connecting the plant with the company's transmission system.

Cal-Oregon on the Klamath

The Federal Power Commission has issued a 50-yr. license to California-Oregon Power Co. for a proposed project on the Klamath River in Oregon to be called Big Bend No. 2. This would be a stream-flow plant, dependent upon releases of water from Link River Dam of Upper Klamath Lake. This project would include a diversion dam 52 ft. high and 310 ft. long, which would divert water through a long tunnel to a powerhouse containing two 37,000-hp. water wheels connected to two 25,000-kw. generators. It would cost about $9,000,000. The license, however, is conditional to require that the company does not commence construction until it has reached agreement with the Department of the Interior for the continued utilization (after 1967) of water stored by an upstream federal reclamation dam.

Northern Lights on the Priest

Northern Lights, Inc., has applied for a preliminary permit for a proposed hydroelectric development on the Priest River and Priest Lake in Bonner County, Idaho. One dam would be on the Priest River about 3 mi. below the outlet of Priest Lake. It would have a powerhouse with about 4,400-hp. capacity. The second dam would be about 8 mi. below Priest Lake and its powerhouse would have a capacity of about 4,600 hp.

EBMUD on the Mokelumne

East Bay Municipal Utility District of Oakland has filed an application for a 36-mo. preliminary permit for a proposed water power development in San Joaquin, Amador, and Calaveras counties in California. The development, which would be located on the Mokelumne River, would include three dams ranging in height

rom 120 to 327 ft., three reservoirs vith a total capacity of 338,500 acre-eet, an increase in capacity of the xisting Pardee reservoir, two power-ouses with a total installed capacity f 32,000 hp., an additional installa-ion of 20,000 hp. in the existing Par-lee plant, and a pumping station.

Montana Power on the Flathead

The Montana Power Co. has re-uested a preliminary permit for a roposed hydroelectric project on the lathead River in Lake County, Mon-ana. The new project would include concrete dam at Buffalo Rapids, a eservoir, and a powerhouse with an nstalled capacity of about 80,000 hp.

Pacific Power on the Lewis

Pacific Power & Light Co. of Port-and has received FPC approval of its equested preliminary permits for two roposed hydroelectric projects on he Lewis River in Skamania County, Vashington. One of the two pro-osed projects, the Swift, would in-lude a rock-fill dam, 225 ft. high. owerhouse, about 3½ mi. down-tream, would be connected to the eservoir by power tunnel and two teel penstocks. The other proposed roject, the Muddy, would include a 00-ft. rock-fill dam. The powerhouse, onnected to the reservoir by a 16,000-t. tunnel and two penstocks, would ouse two turbines, tentatively rated t 25,000 hp.

The Toketee Project

California Oregon Power Co., Medford, Ore., had filed in 1952 re-uesting an amendment of its license or the Toketee Project to include wo additional hydroelectric develop-nents. The two additional develop-nents on North Umpqua River were esignated Lemolo No. 1 and Lemolo No. 2. Construction on them is now nder way.

P. G. & E. on the Kings River

The Commission has affirmed, with ertain modifications, its licensing rders of Nov. 10, 1949, authorizing ower developments by Pacific Gas nd Electric Co., San Francisco, in he Kings River Basin of Central Cali-ornia. The 1949 orders, subsequently ppealed by the Secretary of the In-erior, authorized: (1) a license to PG&E for a hydroelectric develop-nent in the Kings River Basin; (2) n amendment of PG&E's license to nlarge its existing Balch plant on he North Fork of the Kings River; nd (3) a preliminary permit to Fres-no Irrigation District for investiga-ion of the proposed development of power plant at the Pine Flat Dam n the North Fork of the Kings River. The matter of issuance of this icense is before the Ninth Circuit Court of Appeals for review despite he fact that the Secretary of the In-erior withdrew his department's ap-peal during 1953.

MAJOR CONTRACTS *(Continued)*

Morrison-Knudsen Co., Inc., and R. A. Westbrook—Apron at Davis-Monthan AFB	2,368,480
Oberg Bros. Construction Co.—Highway in Los Angeles	1,655,337
J. A. Payton, George Herz & Co., and Clyde W. Wood & Sons, Inc.—Highway in San Bernardino County	2,308,178
Piombo Construction Co.—Bayshore Freeway	3,749,132
J. H. Pomeroy & Co., Inc.—Ford assembly plant at Milpitas	8,600,000
Richards Construction Co.—Housing project at Pacoima	3,188,000
Standard Dredging Corp.—Dredging at Port Hueneme harbor	1,837,865
Stolte, Inc., and Fred J. Early, Jr., Co., Inc.—Sewage treatment plant at Sacramento	3,597,500
Carl N. Swenson Co., Inc.—Concourses at San Francisco airport	1,246,000
A. Teichert & Son, Inc.—Pacoima Wash improvement, Los Angeles	1,805,415
A. Teichert & Son, Inc.—Highway in Los Angeles County	1,193,467
Trepte Construction Co. and Guy F. Atkinson Construction Co.—Hospital at San Diego	2,608,000
Ford J. Twaits Co. and Morrison-Knudsen Co., Inc.—Police facilities building at Los Angeles	6,142,550
Ukropina-Polich-Kral and Ukropina—Santa Ana Freeway	2,476,702
Ukropina-Polich-Kral and Ukropina—Roseville Freeway	1,277,501
Ukropina-Polich-Kral and Ukropina—Highway in Yolo County	1,215,180
United Concrete Pipe Corp.—Friant-Kern Canal distribution system	2,588,202
P. J. Walker Co.—Hangar and laboratory at Edwards AFB	3,806,000
R. A. Wattson Co.—Topico storm drains, Glendale	1,252,000
R. A. Wattson Co.—Eagle Rock-Hollywood conduit	1,411,770
Webb & Knapp Construction Corp.—Apartments at San Diego	9,500,000
Del E. Webb Construction Co.—Hotel at Beverly Hills	14,000,000
R. A. Westbrook, Morrison-Knudsen Co., Inc., and Ford J. Twaits Co.—Runway and airfield paving, Edwards AFB	6,587,130

COLORADO

Bales & Kite—Boulder Creek supply canal	972,077
Ball Construction Co.—Housing project at Denver	2,274,860
George A. Fuller Co.—Sears-Roebuck building at Denver	9,000,000
C. L. Hubner Co.—Denver Valley highway	649,615
Peter Kiewit Sons' Co.—Paving on U. S. 6, Adams and Weld counties	930,060
C. F. Lytle Co. and Green Construction Co.—Runways at Lowry AFB	1,227,706
Schmidt Construction Co.—Highway in Garfield County	729,400
Swinerton & Walberg Construction Co.—Safeway center at Denver	10,000,000
Webb & Knapp Construction Co.—Office building at Denver	15,000,000
Western Paving & Contracting Co.—Runways at Lowry AFB	871,615

IDAHO

Campbell Construction & Equipment—Hangars and paving, Mt. Home AFB	1,260,000
Detweiler & Detweiler—Heating plant and water system, Mt. Home AFB	1,299,059
Carl M. Halvorson—Highway in Jefferson County	489,832
Morgan Electric Co. and Wismer & Becker—Albeni Falls powerhouse completion	990,775
Morrison-Knudsen Co., Inc., and J. A. Terteling & Sons, Inc.—Runways and taxiways at Mt. Home AFB	6,112,015
J. H. Trisdale, Inc.—Clearing of reservoir area for Albeni Falls Dam	1,077,315
Utah Construction Co.—Ground testing facilities, Arco	4,583,030

MONTANA

James Crick & Sons—Bridge in Flathead County	497,909
Eisenman, Seabrook & Elliott—Canyon Ferry Dam powerhouse completion	694,185
Albert LaLonde Co.—Highway in Cascade County	736,589
Ross & Powers Construction Co., Associated Pipe Line Contractors, Eastern Pipeline Contractors, and Engineers Ltd. Pipeline Co.—537-mi. oil pipeline from Billings to Spokane, Wash.	20,500,000
J. Kenneth Thayn Construction Co.—Bull Hook Creek diversion, Havre	788,095

NEVADA

Dodge Construction Co. and Silver State Construction Co.—Highway in Elko County	1,268,295
Gibbons & Reed—Forest road in White Pine County	490,390
Haas & Haynie—Parking garage at Reno	1,000,000
Isbell Construction Co., Inc.—Highway in Washoe County	771,200
Lembke-Clough & King—Test structures and facilities, Nevada Proving Ground, Mercury	1,064,415
Ford J. Twaits Co. and Morrison-Knudsen Co., Inc.—Ordnance storage area at Nellis AFB	9,126,335

NEW MEXICO

Allison & Haney—Water lines in Albuquerque	1,594,539
J. W. Bateson Co., Inc.—Hangar at Walker AFB	3,050,126

Tabulation continued on next page

MAJOR CONTRACTS *(Continued)*

J. W. Bateson Co., Inc.—Hangar maintenance at Walker AFB	2,921,180
Brown Contracting Co.—Highway near Corona	563,990
Campbell & Kay—Range instrumentation sites, Las Cruces	1,167,153
Colorado Constructors, Inc.—Three dams and a dike, Vermejo Project	850,210
Kerr-McGee Co.—Uranium ore processing plant, Shiprock	3,000,000
Lembke-Clough & King—Building at Albuquerque	2,010,001
Lowdermilk Bros.—Highway in Lincoln County	716,865
Skousen-Hise Contracting Co.—U. S. 66 between Barton and Moriarty	599,315
Western Contracting Co.—Aprons and outside utilities, Kirtland AFB	776,771

OREGON

American Bridge Co.—Superstructure for bridge at Umatilla	2,186,915
Baldwin-Hamilton-Lima Corp.—14 hydraulic turbines for The Dalles Dam	19,996,770
Cascade Construction Co. and Austin Construction Co.—Substructure and approaches for bridge at Umatilla	676,305
Donald M. Drake Co.—Hospital for University of Oregon	3,085,410
Goodfellow Bros., Inc.—Columbia River Highway	1,052,192
R. A. Heintz Construction Co.—Pacific Highway	925,903
Vernie Jarl—Columbia River Highway	1,229,045
Peter Kiewit Sons' Co.—Section of Oregon Coast Highway	862,226
Peter Kiewit Sons' Co.—Oregon Coast Highway	984,239
P. S. Lord, Mechanical Contractor—Sewer in Portland	983,850
McNutt Bros. and C. J. Montag—Dexter Dam and powerhouse	4,945,530
Montgomery Electric Co.—Power substation and transmission line nr. Klamath Falls	1,000,000
Morrison-Knudsen Co., Inc.—Earthfill dam, Frog Lake forebay project	880,110
Winston Bros. Co., McLaughlin, Inc., F & S Contracting Co., Johnson, Drake & Piper Co., Inc., Donovan Construction Co., C. F. Lytle Co., S. Birch & Sons Construction Co., Foley Bros., Inc., and Fegles Construction Co., Ltd.—Excavation and substructure for powerhouse at The Dalles Dam site	29,820,997
Porter W. Yett—Pacific Highway	1,140,511

UTAH

Bechtel Corp.—Carbon steam plant at Castle Gate	10,000,000
Bechtel Corp.—Unit 3, Gadsby steam power plant, Salt Lake City	14,750,000
W. W. Clyde & Co.—Highway in Utah County	570,954
W. W. Clyde & Co. and Jacobsen Construction Co.—Ammunition magazines at Tooele Ordnance Depot	1,647,240
Gibbons & Reed—Runway at Municipal Airport, Salt Lake City	643,216
Morrison-Knudsen Co., Inc.—Highway in Wasatch and Summit counties	759,190
Statewide Plumbing & Heating Co., Inc.—Sewers at Murray	814,000
Strong & Co.—Highway in Wasatch County	743,167
Floyd S. Whiting—Highway in Summit County	710,822

WASHINGTON

Blaw-Knox Co.—Chemical processing plant at Richland	40,000,000
Campbell Construction & Equipment Co.—Nose docks at Fairchild AFB	2,989,645
A. J. Cheff Construction Co.—Chandler powerhouse, etc	1,963,085
Cherf Bros. Construction Co., Sandkay Contractors, Inc., and J. A. Jones Construction Co.—Apron paving at Larson AFB	2,471,686
Cherf Bros., Sandkay Construction Co. and J. A. Jones Construction Co.—Apron paving at Larson AFB	2,211,000
Dahlgren Construction Co.—Highway in Seattle	1,248,057
English Electric Export & Trading Co., Ltd.—4 generators for Chief Joseph Dam	4,406,495
N. Fiorito Co.—Maintenance docks and apron paving at McChord AFB	1,282,175
Grove, Shepherd, Wilson & Kruge, Inc.—Waste storage facilities at Hanford AEC Works	2,428,470
Gunther & Shirley Co.—Installation of powerhouse equipment at Chief Joseph Dam	3,419,355
Kansas City Bridge Co. and Massman Construction Co.—Railway bridge over Columbia River	4,444,532
Max J. Kuney Co.—Heating systems at Fort Lewis	1,895,025
Long Construction Co.—East Low Canal laterals	1,799,605
MacRae Bros.—Chehalis River bridge	3,364,025
Osberg Construction Co.—Potholes East Canal laterals	1,383,095
Sound Construction & Engineering Co.—Buildings at Ault Field	2,612,515
J. A. Terteling & Sons—Chandler power canal	1,613,278
J. A. Terteling & Sons—East Low Canal	2,904,235
Valley Construction Co.—Utilities at Ault Field	1,644,651
Woodworth & Co., Inc.—Highway in Pierce County	1,278,395

WYOMING

Stanley H. Arkwright, Inc.—Highway in Sweetwater County	695,000
J. H. & N. M. Monaghan & Associates—Highway in Laramie County	460,176
Morrison-Knudsen Co., Inc.—Lodge at Grand Teton National Park	4,500,000
Summit Construction Co.—Highway in Crook County	659,499
Taggart Construction Co.—Highway in Teton National Forest	492,003

WELDING BRIDGES

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not competent to judge the work of the man who passed the laboratory test on Thursday and does not feel good enough on Monday morning to try to do his work well. He might even be negligent about requiring the welds to be the specified size.

Tests of groove welds for primary work should be made with laboratory equipment.

Training methods

There are unlimited possibilities for getting the job done better, quicker and cheaper with welding. To do so requires ability to recognize the possibilities and to plan and supervise the work. Texas is developing a number of subcontractors of structural welding who quote general contractors. And a group of trained inspectors supervise the primary welding done both by contractors and the department's maintenance forces. These men train the department's own welders and local inspectors of secondary welding. They are members of the American Welding Society and have come up through the welding operator group. They can demonstrate as well as inspect.

The inspector is the key man in welded construction. Actual experience and ability as a welder, while not absolutely necessary, enables an inspector to find defective work more quickly and recognize the cause of it. His practical sense is better. He will be a better inspector if he knows a little about welding metallurgy.

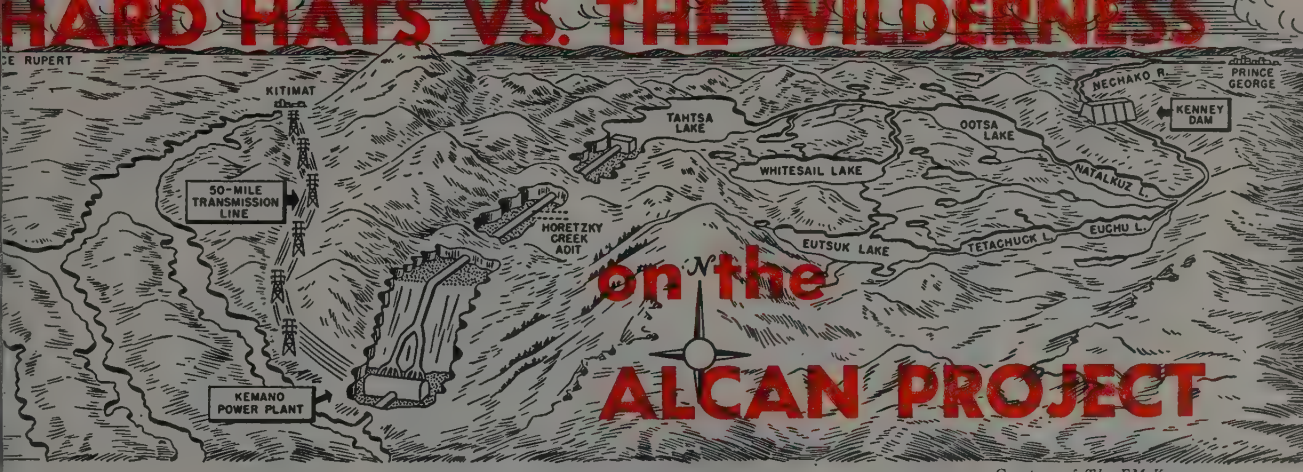
Texas kindergartens

One approach to the problem of training field forces in welding is the so-called "Kindergartens" used in the various Texas districts just prior to the beginning of work on a welded bridge. All graduate engineers, chief inspectors, the equipment supervisor, welders from the shops and supervisory employees from the organizations of contractors working in the district attend the Kindergartens. (Texas has 25 districts which include all of the state's 254 counties.)

The regular pattern for a Kindergarten is three night sessions from 7:00 to 10:00 p. m. on successive days. Printed material is issued ahead of the first meeting. The curriculum is made up of training films, talks illustrated by slides, and actual demonstration and practice work. Discussion is insisted upon.

Attention to the training of men in proper welding practices is a good investment. For with proper design and proper welding, repairs of old steel structures can be made quickly and easily. And for new structures welding can result in simplified detailing, quieter erection, neater appearance and cost savings by reduction of dead weight.

HARD HATS VS. THE WILDERNESS on the ALCAN PROJECT



Courtesy of *The EM-Kayan*

ART 3

Transmission towers top tough topography

THE TRANSMISSION line for the Alcan Project is the one rincipal division of the work where nstruction handicaps and the spec- cular results of overcoming them e readily apparent to the most sual observer. This line from the werhouse and switchyard at Ke- ano to the smelter site at Kitimat averse 50 mi. of British Columbia untry in which are represented any conditions making heavy trans- ission line construction difficult.

From the switchyard outside the werhouse at Kemano the first 9 mi. a double-circuit steel tower line up e Kemano River Valley to a switch- g station at the western end of the ss section. The topography of the emano-to-Pass section is more uni- rm than that of the other two sec- ns yet it presents serious founda- n difficulties. Part of it is on slop- g ground along the rock promon- ries and on talus-covered areas of e steep mountains enclosing the lley. The parts located on the flat avelly area formerly covered by the ver present serious dewatering oblems, unstable slopes for excava- n, and matted brush and logs de- sited by former river courses at e foundation sites.

elicopters and highlines

The pass section of 10.6 mi. is cated over a low pass at elev. 5300 the divide between the Kemano d Kildala River watersheds. Thirty et of snow shifted about by heavy nds is not uncommon in the pass. wer locations skirt a large glacier d angle left and right, taking ad- ntage of every feasible site for undations within a span's length of ch other.

While a construction road with ades over 30% has been built to rve the transmission line, many of e tower sites can only be served by helicopter, or highlines rigged from accessible points along the road. Travel over the construction road is practicable only by 4-wheel drive transportation equipment such as Willys jeeps, Dodge power wagons and FWD trucks.

Two single-circuit tower lines are being constructed over the pass section. The right line will be of steel towers and the left line a new design of aluminum towers. Steel towers with base plates and anchor bolts weigh approximately 42 tons each; aluminum towers weigh 22 tons each.

For design data two tubular aluminum towers about 30 ft. high were built at the 5,300-ft. level. Icing and wind conditions were noted by observers and recording instruments during the 1951-52 and 1952-53 winters. Ice loading was approximately 2½ lb. per lin. ft.

The conductors in the pass section will be 2.295-in. diameter, weighing 4.76 lb. per lin. ft., with a net strength

TOWER LOCATIONS through windy, snowy pass take advantage of every feasible site for foundations. But many sites are accessible only by helicopter (shown making an air drop at el. 5,300) or highlines rigged from points along construction road (inset picture shows a compressor traveling the highline to site on rocky promontory).

TUBULAR ALUMINUM towers weighing 22 tons each were introduced on the Alcan Project to carry one of two single-circuit lines over pass; steel towers, 42 tons each, carry the other. Both types are shown in this view. Note highline required to reach this site.

of 135,700 lb. This conductor is made up of 108 strands of aluminum wire wrapped around a core of 37 strands of steel wire. This cable is manufactured by Alcan at its Shawinigan Falls, Quebec plant and shipped by water to Vancouver, B. C., where it is transshipped by barge to Kemano.

The pass-to-Kitimat section, 30 mi. in length, from the switching station at the eastern end of the pass on the headwaters of the Kildala River, follows the river to tidewater at Kildala Arm, then over Green Mountain to the tidal flats at Kitimat. It is double-circuit steel tower line similar to the one in the Kemano Valley. In addition to the foundation and access problems of the Kemano section, added problems were encountered in the tundra and marshy mountainous portion and in tidal flats where pile foundations were required.

Few footings identical

For the total initial construction of 306 towers and two intermediate switching stations, there are hardly two tower footings identical. Most of the towers are at line angles. The design may vary for the legs of one tower, even where surface indications are similar, because of faults or seams encountered in the rock or obstructions found in the gravelly river bottom. As little as 7 cu. yd. of concrete has completed the footings for one tower and as much as 625 cu. yd. has been required for another.

Final design and type of footings are determined by B. C. I. E. field engineers as the foundation excavation progresses. Many changes are made in tower locations. Tower heights to lowest cross-arm vary from 68 to 81 ft., and from 107 to 127 ft. to the top cross-arm.

The right-of-way is cleared 325 ft wide and "danger" trees along the right-of-way are felled. There is a very thick stand of spruce, hemlock and cedar in the right-of-way. The trees are felled, slashed and slashings burned. Trunks are left as felled. This leaves almost a log pavement in places, difficult to traverse. It does provide a skidway for stringing the conductors which otherwise might be damaged on the rough rock and jagged boulders. This clearing, of approximately 2,600 acres, is being done under subcontract by Hunstone Welters and Howard of Vancouver B. C.

Marketable logs felled in clearing the Kemano section of the transmission line are yarded to the construction road, loaded on logging trucks and hauled to a sawmill at Camp 5. Here, mine stulls, lagging, shiplap, flooring and dimension lumber not requiring the structural strength of Douglas fir are produced for the project. The need for a considerable amount of lumber is not readily apparent. The quonsets and prefabricated panel buildings require comparatively little, and tunnel timber are not easily observed. Yet, over 18,000,000 fbm. of lumber has gone into the project from this small mill.

The logging and sawmill operation is being done under subcontract by the Kemano Timber Company Limited, Vancouver, B. C.

The construction season on the transmission line is very short. Camps, roads and tower sites were still being cleared of snow in July in the pass section. To speed up this operation helicopters spread lamp black at camps and along the road to speed melting of snow. About 40 towers were erected in the 1952 season, but the bulk of the work must be completed this summer before snows and winds make work impossible in the fall of 1953, because the high sections will not be accessible for work next spring in time to meet the schedule for electricity on the line before June 1954.

O. N. Parker is Electrical Superintendent for transmission line construction, E. E. Larkin is Superintendent, steel erection, and A. J. Downey, Superintendent of cable stringing.

PART 4 of this series, covering the contractor's field engineering for the Alcan Project, will appear in the February issue. A later article will cover dam construction on the project.

REPORTS from the COURTS

By HOWARD S. BURNSIDE, Attorney and Registered Engineer

Unlicensed contractor cannot recover

ALMOST as certain as death and taxes is the regularity of cases involving unlicensed contractors failing to recover money due for work done. This point of law has arisen again and been determined in the usual fashion. If a contractor in California is not licensed as required by the Business and Professions Code he cannot recover in court on his contract regardless of whether the work was properly done at a fair price.

A new avenue of enforcing such a contract was sought in the case at hand. The general contractor assigned to a collection agency the promissory note given by the owner for the final payment on the job. The court held, in effect, that the collection agency could not enforce payment where the general contractor himself could not do so.

Note that here the license of the contractor was automatically suspended under the statute[1] which provides that the license is ipso facto suspended 10 days after the departure of the responsible managing employee who qualified on behalf of the business unless written notice of the fact is given the registrar.

This contractor was advised in 1951 that his license had been suspended 4 years earlier although he had been paying his annual license fee which had been accepted.[2]

[1] *Calif. Bus. & Prof. Code* 7068.
[2] *Shields vs. Shoaff* 253 P. 2d 1002.

Bridge modernization held state responsibility

A RAILROAD company constructed a bridge over the Sacramento River and granted the privilege of using the upper deck as a roadway to the counties on either side of the river. The railroad company agreed to keep in repair and operate this portion of the bridge for which the counties paid an annual fee.

Many years later a passenger in a bus was injured when the bus ran off the highway deck and crashed to the ground below. The question then arose as to whether the railroad was responsible for the alleged failure to alter the structural features of the bridge to meet changing traffic conditions from 1910 to the present day. This was resolved in favor of the railroad company. The court observed that the railroad "did not become obligated by the mere grant of the easement to maintain the easement in a safe condition for the protection of those using it at the invitation of the easement owners, the two counties . . ." and it was not incumbent upon (the railroad) to alter these structural features . . . or substitute others, therefor to accommodate the changing needs of public travel according to future development . . . all changes of that character proceeded at the instance and cost of the state pursuant to its statutory duty."[1]

[1] *Whalen v. Ruiz* 253 P. 2d 457, 40 Cal. 2d 294.

Extra engineering not chargeable to contractor

Plaintiff, a general contractor, entered an agreement with the City to build a reservoir within a specified period of time. The City also contracted separately with consulting engineer Whipple for all necessary engineering services, and this was a fixed-fee contract.

When the specified construction period expired, the contractor requested and received from the City Council extensions of time and completed the job about 10 months later. In receiving these extensions, the contractor told the Council he would bear extra engineering costs, if any, having in mind the fixed-fee engineering contract and believing there would be no such extras. The construction contract provided that the City might withhold actual costs accruing during extension of time for engineering and overhead expenses directly chargeable to the contract.

During the period of extension, the City allowed claims by engineer Whipple for services in excess of his fixed fee and then withheld this cost from the contractor's final payment. The contractor sued the City to recover his final payment, contending that no such engineering costs were properly chargeable to him and he joined engineer Whipple as a defendant. Whipple then asserted a lien on the withheld fund.

The trial court found in favor of the contractor and also that Whipple had no claim on the fund. The judgment for the contractor was affirmed on appeal. The gist of this decision is that the City couldn't arbitrarily allow extra engineering costs, then charge them to the contractor.

The reader may wonder what happens to Whipple if the extended time caused his expenses to go beyond what was contemplated by his fixed-fee engineering contract. The higher court recognized this problem by its decision and held its opinion to the issues between the contractor and the City. Whipple will have to find his protection in his own contract with the City, which is another matter.[1]

[1] Crane v. City of Ukiah, 243 P. 2d, 582.

Contractor liable for defective construction road

A PAVING CONTRACTOR engaged in surfacing a new highway bridge closed the bridge and reopened a by-pass road previously made by the bridge contractor. He informed the State Highway Department he would make repairs without cost to the State. The by-pass road and temporary bridge had been used by local traffic and the general public for more than a year while the new bridge was being built. At the point in question, the State had a 130-ft. right-of-way, the traveled portion of the road was 18 ft. wide, and 6 ft. off the traveled portion there was a tree-stump 18 in. high and 10 in. in diameter. The road was very dusty. The stump resulted from clearing operations when the road was first made.

On the night of March 11, 1950, one Lanoy observed headlights behind him as he entered the by-pass and saw the lights again when he reached the temporary bridge. Shortly afterwards he heard a crash. He stopped his car, went back and saw that the car behind had run into the stump. The driver of the car was Mrs. Worley. She was dead.

Suit was filed and the jury returned a verdict against the paving contractor which was affirmed this year on appeal to the higher court. In announcing its decision, the court stated the rule that a "highway contractor doing work on a highway is bound to act reasonably and with due regard for the rights of persons lawfully using the way, and is liable for injuries resulting from his negligence in the performance of his work."

This liability "arises out of a legal duty devolving upon him, as well as the public in general, not to obstruct or make the highway dangerous for ordinary use."

Thus the jury was properly instructed to bring in a verdict against the contractor if it found that he failed to keep the by-pass in good order so as to be reasonably safe.

There was a strong dissenting opinion, based partially on the fact that the stump was off the traveled portion of the road.

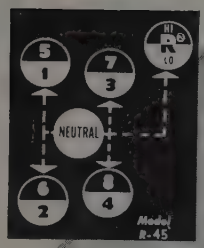
Briscoe v. Worley 253 P. 2d 145.

One lever controls

8 FORWARD SPEEDS

TWO REVERSE SPEEDS

NO GEAR-SPLITTING!



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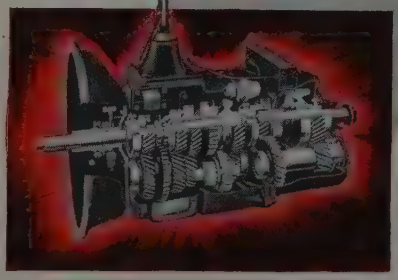

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WESTERN CONSTRUCTION NEWS

DENVER POWER PLANT—Ebasco Service, Inc., of Denver, Colo., has been awarded a $17,000,000 contract for designing and constructing an addition to the Arapahoe Power Plant in Denver by Public Service Co. of Colorado.

BLUE MEANS SLOW—Flashing blue lights are being attached to all snow-removal machinery by the Wyoming Highway Department, according to J. R. Bromley, chief engineer. The two-way blue flashers, indicating working snow plows and similar equipment, have been adopted recently as a national standard by all states. This means slow down, men working, danger ahead, Bromley said. Wyoming has almost 230 such pieces of snow equipment in operation this winter.

DAM TO GROW TALLER?—Seattle City Light has asked the City Council for $165,000 to carry on studies for raising the height of Ross Dam on the Skagit River from its present 540 ft. to an elevation of 665 ft. J. L. Savage, a Denver consulting engineer, has been recommended by E. R. Hoffman, City Light superintendent, to draw up the plans, specifications, and estimates. Construction of the Ross Dam powerhouse was described in *Western Construction* for October, 1952 on pages 72-76.

A STRESS RELIEVING furnace has been added to the facilities of Chicago Bridge & Iron Co. at Salt Lake City. Put into operation in 1953, the furnace will handle units as large as 10 ft. in diameter and 34 ft. long. Intended use of the furnace is for company work only, but outside jobs will be stress-relieved at a reasonable cost if requested.

Typical application of the new furnace will be stress relief of entire pressure vessels fabricated by Chicago Bridge & Iron Co. Such treatment is a requirement of certain codes. In addition, complicated weldments produced in the Salt Lake City plant will also be handled. For example, top sections of elevated tank columns will be connected to the adjacent shell plates and stress-relieved as single units.

A recirculating air system fired by oil burners supplies heat to the furnace. Air inlet and outlet ducts are at the bottom and top of the furnace respectively, and the heating unit is completely on the outside. It is anticipated that conversion will be made to gas firing at a later date. Except for the heating unit, the furnace was fabricated and erected by the Salt Lake City plant force of Chicago Bridge & Iron Co.

CLEANOUT DOORS for oil storage tanks head for the new furnace at Salt Lake City. Fabrication of tank shell plates with cleanout openings involves considerable welding in which there may be locked-up stresses needing relief. As an indication of scale in this picture, clearance above the flat car bed is 12 ft.

LOTS OF LOTS—Albuquerque's (New Mexico) largest home-building project is well under way, according to Edward H. Snow, the contractor. The project will include 1,150 two-, three-, and four-bedroom homes being built on a 320-acre tract. Construction plans include a large park and shopping area, churches, and schools. The project is expected to cost approximately $10,000,000.

"HOLIDAY" HOTEL—Construction was scheduled to start in the middle of December on a $3,000,000 motor-hotel to be known as "The Holiday" in Reno, Nevada. The hotel will be 8 stories high and contain about 180 rooms. It will include an underground garage with accommodations for 122 cars. Construction is expected to be finished by September 1954.

WESTERN CONSTRUCTORS, Inc. of Phoenix, Ariz., submitted a low bid of $363,952 to grade, drain, place base course, surface with bituminous plant mix, and seal coat about 4.6 mi. on U. S. 66 in Navajo County. This work was ordered by the Arizona State Highway Department. Completion date is October 31, 1954.

PUTS OUT POWER—The first of three generators which will produce 50,000 kw. of power at Canyon Ferry Dam is now producing power, according to W. P. Price, Jr., USBR project construction engineer at the $29,000,000 Montana dam project. The other two generators are expected to be in operation by early March.

TECOLOTE TURKISH BATH—The toughest tunnel driving job anywhere is how the Tecolote water diversion tunnel of the Cachuma Project was described by miners working for Halvorson Contractors. Among the things holding them back include hot gases, vapors, scalding waters, and temperatures reaching 107 deg. Water flow of between 4,000,000 and 5,000,000 gal. daily at pressures of up to 300 psi. complicates the job. The

Caterpillar No. 6 Shovel gets the call on Chicago's biggest excavating job

Excavation for the huge 2350-car, multi-level, underground Grant Park Garage, on Chicago's lake front, involves moving more than 500,000 cubic yards of earth. It's the biggest job of its kind ever undertaken in the city.

When the digging started last spring, several competing types of tractor-shovels were tried out by Speedway Wrecking Company, excavating contractors. It was the Cat* No. 6 Shovel that won hands down.

The big bucket of this No. 6 handles 2-yard loads with ease. Loading into trucks, Speedway reports average production of 140 cubic yards per hour. And the machine turns in this kind of performance day after day without a hitch.

Excellent visibility, easy control, fast lift and turn action are added reasons why operators and owners both like this big, tough digging and loading tool.

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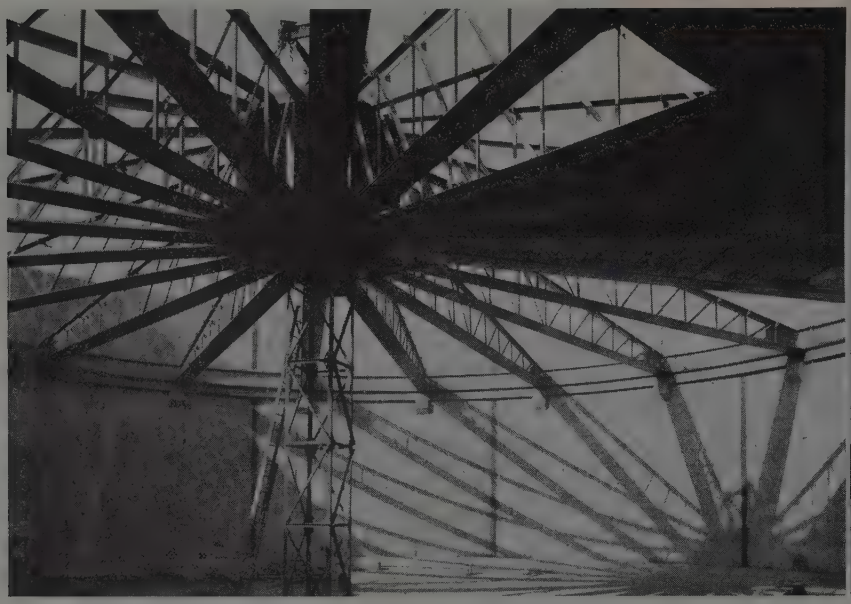
STRUCTURES FOR SACRAMENTO SEWAGE PLANT

Finishing touches are put on a 50,000-gal., 90-ft., 6-in. high watersphere (right) at the new Sacramento, Calif., sewage disposal plant. Shown below is erection of one of five 100-ft. diameter floating covers for sedimentation tanks being placed by a Chicago Bridge & Iron Co. crew under the supervision of L. J. Abel, foreman. Both watersphere and covers were fabricated at Chicago's Salt Lake City plant. The sewage plant is being built by a joint venture of Stolte, Inc., and Fred J. Early, Jr., Co., Inc., for $3,597,500 under the supervision of William Yarnell, Jr., superintendent. The job was 70% finished on December 1, with completion date scheduled for August 1954. Clyde C. Kennedy designed the plant. W. E. Shaw is resident engineer.



sulphurous atmosphere is the result of volcanic activity in the area, according to USBR engineers. Work on the project was described in *Western Construction* for August 1950 on pp. 67-68, September 1951, pp. 78-79 and 150, and September 1953, p. 75.

BIG CLIFF reregulating dam in central Oregon had its diversion tunnel plugged with 15 reinforced concrete stoplogs to start filling of the reregulating pool and permit the start of pouring on a 30 ft. long concrete plug which will seal the 28 ft. wide, horseshoe-shaped tunnel. The normal pool level of 1,206 ft. above sea level was expected to be reached about January 1. The 18,000-kw. Big Cliff power plant was expected to be in operation by April.

IDAHO's Department of Highways awarded several large contracts in the middle of November. J. F. Konen of Lewiston, Idaho, was given the job to construct 6.1 mi. of roadway and a concrete bridge in Clearwater County for $291,169. Completion date is September 15, 1954. Frank G. Baulne of Yardley, Wash., was awarded a $266,196 contract to build and surface 2.4 mi. of highway in Idaho County. Completion date is September 15, 1954. Tony Marrazzo of Boise, Idaho, received a contract to build and surface 7.4 mi. of highway in Lewis County. His bid was $594,530. Completion date is 180 working days after November 13, 1953, the date of the award.

CONSTRUCTION has begun on a 2,000,000-gal. reservoir to supplement the existing water system at Pleasanton, Calif. Zaballos Brothers was awarded the contract for $98,000.

SNOWPLOW AND SALT spreader box equipment in the Sandia Mountain area has been doubled by the New Mexico State Highway Department in an effort to keep Tijeras Canyon open during the snow season. This gives the district a total of six snowplows and eight salt boxes. The boxes are being operated on U. S. 66, 666, 85, and state roads 44 and 550.

COWLITZ DAMS HIT LEGAL SNAG—Plans of the city of Tacoma, Washington, to build two dams on the Cowlitz River to provide hydroelectric power ran up against legal snags when the State Game Commission and the State Department of Fisheries prepared an appeal against the decision of the State Supreme Court which ruled that Tacoma holds a valid license to build the dams from the Federal Power Commission. Other opposition to the dams came mainly from sportsmen's organizations, which contend the dams would destroy the state's last good salmon-spawning area.

TO REDUCE ACCIDENTS on the Cajon Pass highway, the California State Highway Commission has ordered immediate construction of a 20-mi. stretch of 4-lane divided freeway. Bids have been called on the project for what is expected to be the largest single contract ever awarded in San Bernardino County, approximately $2,570,000. The work will be undertaken with funds of the present fiscal year rather than wait for the 1954-55 program, according to George T. McCoy, state highway engineer.

RECENT CONTRACT awards in Alaska include a $1,250,767 contract for construction of a general depot warehouse at Fort Richardson to Schmidt & Lewis of Seattle, Wash. Completion date is March 1955. Boen-Koon Construction Co. of Seattle received a $308,214 contract for construction of nine underground ammunition storage magazines. Completion date is December 1954. Low bidder on a Bureau of Reclamation job to build a substation at Anchorage on the Eklutna Project was City Electric of Anchorage, Inc., of An-

chorage, Alaska. The bid was $143,-034. It is interesting to note that the highest of the eight bidders on this project was some $17,000 below the engineer's estimate.

MAJOR CONSTRUCTION JOBS put out to bid in Oregon recently included a job to build 103,761 ft. of storm and sanitary sewers in Portland. P. S. Lord of Portland was low bidder on the job with $748,150. Peter Kiewit Sons' Co. of Longview, Wash., was awarded a $636,970 contract to build a 1,637-ft. bridge in Douglas County across the North Umpqua River. Low bidder on a Corps of Engineers job to grade and drain 8.7 mi. of double track railroad and 7.1 mi. of U. S. 30 at The Dalles Dam in Wasco County, Ore., was a joint venture of Fred H. Slate Co. and E. C. Hall Co. The bid price was $2,591,261.

SIMPLICITY is the key word on construction of the million-dollar sewage disposal plant project in Albuquerque, New Mexico. The city asked Southwest Engineers, a consulting firm, to remove such architectural embellishments as glass doors, insulating windows, and glass-block walls from the plant. C. H. Leavell & Co. has the contract.

SNOW FIGHTERS — California's annual battle against snow on the highways has been aided by the addition of two-way radio equipment to more automobiles and trucks, according to Arnold H. Carver, communications engineer. He said that 600 of the state's maintenance vehicles have been provided with the two-way sets, more powerful sending equipment has been installed in coastal and mountain areas, and some fixed relay stations have been relocated which makes direct contact with the radio station headquarters at Sacramento possible.

CHIEF JOSEPH DAM on the Columbia River near Bridgeport, Washington, is more than half completed in the powerhouse area. There are 817,000 cu. yd. of concrete in place on the main dam, which is 90% complete, with about 180,000 cu. yd. still to be poured. Columbia River Constructors hold the powerhouse contract on this Army project, which is expected to be one of the greatest power producers in the world. Completion date on the main dam is set for early 1955.

AN INTERESTING SIGN of the times comes from the State Road Commission of Utah. It seems that there were 16 bidders on each of two jobs put up for bid by the state. One was a job to build 3.5 mi. of gravel-surfaced road in Box Elder County. Low bidder was Germer, Abbott & Waldron of Tremonton, Utah, who submitted a price of $58,586. Low bidder on the other job, which was to build 4 mi. of road-mix, bituminous surfaced road in Weber County, was Fife Construction Co. of Brigham City, Utah, who submitted a figure of $106,227. Young & Smith Construction Co. of Salt Lake City was low bidder on a job to build 7.9 mi. of graded roadway and three concrete structures in Summit County. The figure submitted was $642,336.

RIVERTON, WYOMING, has contracted with the King Engineering Co. for construction of an access road, parking area, standby power plant, and fencing at the Riverton airport.

LAND SUBSIDENCE at Long Beach (California) Harbor has decreased from 2.35 to 1.69 ft. a year since last year, according to Charles L. Vickers, Port of Long Beach assistant general manager. An estimated $120,000,000 will have been spent to stop the sinking by 1965, when the land sinkage is due to end.

THE CITY OF SEATTLE, Washington, has applied for a preliminary permit for a hydroelectric project at the Boundary Site on the Pend Oreille River in northeastern Washington. The project would include a dam 300 ft. high with a crest length of 500 ft. It would be located a mile south of the Canadian border. Included would be a powerhouse capable of generating 570,000 kw. The power would be transmitted to the Bonneville Power Administration grid system by means of two 230-kv. circuits to the Spokane area.

DENVER FREEWAY — An 11-block section of the Denver, Colorado, Valley Highway freeway project was opened to traffic late last year. The project, built at a cost of $800,000, included grading, paving, and erection of two twin bridges and an interchange. The Northwestern Engineering Co. had set January 1 as completion date for the entire project, but reported that late delivery of construction material could hold it up.

PIPELINE PROGRESS—Construction of the 537-mi. Yellowstone pipeline from Billings, Montana, to Spokane, Washington, is well under way. Contracts for the 10-in. pipeline, which is scheduled for completion in September 1954, were awarded to four contractors for a total of $20,-500,000. The contractors are Ross & Powers Construction Co., Associated Pipeline Contractors, Eastern Pipeline Contractors, and Engineers Ltd. Pipeline Co. The line will cross the Continental Divide at a height of 6,200 ft.

LOW BIDDERS on some of the recent jobs put out to bid by the California Division of Highways included the following: R. E. Hazard Contracting Co. and W. F. Maxwell bid $1,204,832 to grade and surface 1.7 mi. and build four bridges in the city of San Diego. Winston Bros. Co. of

Continued on page 98

CONTRACTOR'S CRANES RAISE SUNKEN TUNA CLIPPER

Pioneer Truck Co., subsidiary of R. E. Hazard Co., San Diego building contractor, did an unusual rush job when a tuna clipper (fortunately minus a load of tuna) sank in the San Diego harbor. With the aid of pumps aboard the submerged vessel, two of the contractor's P&H truck cranes succeeded in raising her in just 24 hours, a big task considering the clipper's 95-ft. overall length and 100-ton weight. In picture, one crane has a line already around the stern section, while the second prepares to put a sling aboard the forward part. The clipper is now back in service, none the worse for the experience.

. . . Continued from page 73

California, $34,000,000; and in Nevada, $1,000,000. Construction of anti-aircraft protection and other facilities for the Army throughout the district, $8,250,000.

An indication of the going volume of military construction at a given date is provided by the figure of $64,000,000, the estimated value of active contracts in the district at the end of October 1953. At the same time, civil works activity was estimated at $13,000,000.

Principal projects of civil works remaining to be advertised during the current fiscal year in Los Angeles District include additional work at the San Antonio reservoir, and improvements to another 1.7 mi. of the Los Angeles River channel. The former work encompasses about 5,351,000 cu. yd. of embankment and 33,000 cu. yd. of concrete in the construction of an earthfill dam 160 ft. high and 3,850 ft. long. The channel improvements will provide a bottom width of 115 ft., completely paved with reinforced concrete; grouted cobblestone side slopes, miscellaneous structures and 3 highway bridges. Major quantities include 1,100,000 cu. yd. of excavation, 46,000 tons of cobblestones, 23,000 sq. yd. of double bituminous surfacing, and 40,000 cu. yd. of concrete.

River channel improvement work of the foregoing type has been a major continuing effort of the Corps of Engineers in Southern California. Two contracts awarded in 1953 and continuing into 1954 are illustrative.

Work in Pacoima Wash downstream from Lopez Dam is being pushed by Guy F. Atkinson Co. on a $1,728,800 contract begun last June and scheduled for completion in April. This job is a little ahead of schedule, being about 90% complete by the end of the year. Auxiliary structures, including side drains, operating houses for diversion works, and catch basins are the principal items of work remaining. Leonard Hogue is project engineer, and the contractor's superintendent is Charles Thompson.

Also ahead of schedule are channel improvements on Rio Hondo, where a joint venture of A. Teichert and Bressi & Bevanda has a $2,456,400 contract. Frederick C. Bennett is project engineer on this work, and project manager for the contractor is Robert Skinner.

The latest of several contracts for construction of the Whittier Narrows project is another held by the Teichert-Bressi & Bevanda combination. Their work began in October 1952 and should be complete in April of 1954. The contract amount is $3,747,300. James G. Morgan is project engineer for the Los Angeles District. Project superintendent for Teichert is James Cagle, and for Bressi & Bevanda, Lowell Wright. The work encompasses the central embankment, channels, and Rosemead Boulevard relocation.

Activities of the Corps of Engineers in the Southwest are administered by Col. Paul D. Berrigan, South Pacific Division Engineer. District engineers at San Francisco, Sacramento, and Los Angeles are Col. George H. Walker, Col. W. J. Ely, and Col. Arthur H. Frye, Jr.

ALASKA—

As 1954 begins, it is estimated that about $238,000,000 in construction remains to be physically accomplished under the planned program for Alaskan defense. Of this estimated total, about $80,000,000 remains to be placed under contract. Construction already in progress or yet to be administered by the Corps of Engineers therefore totals over $150,000,000 and represents a sizable work load for the many Western contractors who are working in the northern territory.

The military construction program in Alaska, known as the Alaska Defense Construction Program, was initiated in 1946 under the supervision of the Corps of Engineers. Since the initial days of this program, about $550,000,000 in projects have been completed and turned over to the principal using agencies, the Army and the Air Force. The entire program, including what is proposed for the future, is estimated to total $788,000,000.

During the remaining six months of the current fiscal year, 89 separate projects are expected to go to contract from funds already appropriated. Total value of the work, which is scattered among Army and Air Force bases throughout the Territory, is about $50,000,000. The individual projects range in value from well under $200,000 to over $5,000,000 —the latter being a very round estimate for an airmen's barracks at Ladd Air Force Base near Fairbanks.

Also at Ladd, at least $3,000,000 will be expended on road and street construction. Other work estimated to cost more than $1,000,000 includes completion of the water treatment plant and water storage reservoir at Fort Richardson, rehabilitation of dormitories at Elmendorf Air Force Base, a depot warehouse at the same base, a multi-purpose dock at Eielson Air Force Base, and two new installations at Whittier, the Army's port southeast of Anchorage. Over $4,000,000 will be spent there on family housing and civilian bachelor quarters. Also, the dock facilities which were wiped out by fire last June will be reinstated, with $3,000,000 or more to be put into the work this year.

Colonel L. H. Foote is district engineer for the Alaska District.

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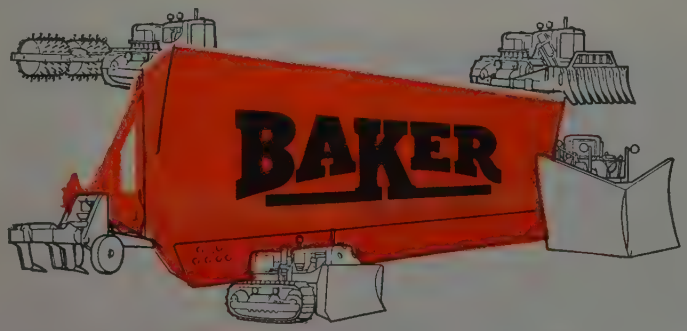

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Monrovia, Calif., bid $1,958,110 on a contract to build 2.5 mi. on the Santa Ana Freeway near Santa Ana. Frontage roads, interchange connections, and five bridges are included in the job. Madonna Construction Co. of San Luis Obispo, Calif., bid $1,019,922 on a job to grade and pave 5.9 mi. of a four-lane divided state highway in Santa Barbara County. A Teichert & Son, Inc., of Sacramento, Calif., bid $737,583 on a job to grade and surface 10.1 mi. of state highway in Sacramento and Placer counties. The job includes construction on frontage roads and overcrossings.

TACOMA PORT BRIDGE—The $1,600,000 Port Industrial Waterway Bridge at Tacoma, Washington, has been opened to traffic. The 712 ft. long bridge, which took nearly two years to build, has a lift-span to permit passage of ocean-going vessels. It was built by Roy T. Earley Co., and Anderson Bridge Construction Co.

BIGGEST BOILER—Excavation has started for installation of the largest capacity boiler ever to be operated in New Mexico at the Public Service Company's new Person Station in Albuquerque. The new boiler will produce 35,000 kw. of power operating at a pressure of 875 psi. and a temperature of 910 deg. Steam will be produced at a maximum capacity of 335,000 lb. during short periods. W. W. Winger is construction superintendent on the job for the utility.

MONTANA'S State Highway Commission opened bids on several big projects recently with the following results. Stanley H. Arkwright, Inc., of Billings, Mont., bid $352,302 on a job to grade, drain, and surface 6.7 mi. of highway in Big Horn County. The sum of $231,941 was bid by The O'Neil Construction Co. of Havre, Mont., to grade, drain, and surface 9 mi. of highway in Phillips and Valley counties. S. Birch & Sons Construction Co. of Great Falls, Mont., bid $206,057 on 9.3 mi. of grading, draining, and surfacing in Teton County. In each case, the low bidder was awarded the contract at the bid price listed.

SEAL COAT OILING was all that remained to be done on the Carl E. Nelson Co. contract to build 10 mi. of cement-stabilized base and plant-mix surface roadway in Bannock County, Idaho, when N. E. Parson, the general superintendent, reported job progress. This was the first job of its type in Idaho, and Parson added his endorsement with the conclusion that "this construction makes a very good base, which you have to have to get a good finish pavement."

Successful execution of the contract is indicated also by Parson's observation that "all in all, we did get a beautiful job." Major items of the equipment spread included three Cat motor graders, seven rollers, four Cat D8s with dozer blades, two crushing and screening plants, two Seaman Pulvi-Mixers (one with water pump and spray bar), one Flynn cement spreader, four bulk cement trucks, fifteen dump trucks, one complete Madsen hot plant, and one Barber-Greene paver. The four bulk cement trucks, which operated on a 25-mi. haul, were ordinary dump trucks with steel tops job-built on the dump beds. Special end gates allowed the cement to be dumped directly into the spreader.

Job personnel included Sam Gillette, job superintendent; Arnold Draper, grade and base foreman; Bill Cazier, cement-stabilized base foreman; LaVon Chatterton and Reid Spackman, crushing plant foremen; Jack Morgan, hot plant foreman; Les Fairless and Norm Jones, street foremen, and H. C. Christensen, timekeeper and office man.

FIRST JOB of its type in Idaho was this Carl E. Nelson Co. contract to build 10 mi. of cement-stabilized base and plant-mix surface roadway in Bannock County. A Pulvi-Mixer and tank truck apply the plant-mix surface.

OIL IN PACKAGES?—Quaker State Oil Refining Co. plans to build an oil packaging plant at Portland, Oregon. The plant will include storage tanks and a 60 x 200-ft. warehouse. Daily capacity of the plant, which will can oil for distribution throughout the Pacific Northwest, will be 25,000 gallons.

CANADIAN HARDROCK miners claimed a tunnel-driving speed record of 21 mo. when they holed through a 10.1-mi. tunnel under the coastal mountains of British Columbia on December 2. The job (*Western Construction*—December 1953, pp. 64-67 and 81) is part of the Alcan Project. The miners removed more than 2,300,000 tons of rock from the 25-ft. diameter tunnel. One drilling crew set a record of 282 ft. of tunneling in 6 days, including a 1-day record of 61 ft. (See p. 87-88 of this issue for another story on the Alcan Project.)

SHELL REFINERY GOING UP—Clearing work is progressing on 400 ac. near Anacortes, Washington, where the Bechtel Corporation will build the Shell Oil Co.'s $75,000,000 oil refinery. The entire building is expected to be finished by the end of 1955. L. T. Tuttle, Bechtel subcontractor manager, has charge of the clearing work.

HENDRICKS CANAL TUNNEL near Chico, California, has been completed, according to George L. Works, Pacific Gas & Electric Co. division manager. The tunnel, which is 4,660 ft. long, diverts water from the west branch of the Feather River to company powerhouses on Butte Creek. Morrison-Knudsen Co., Inc., was contractor on the $700,700 job.

SEVERAL BIG construction jobs in Washington were bid on during the latter part of 1953. General Construction Co. of Seattle bid $1,387,655 on the substructure and approaches of the First Avenue So. bascule bridge and was awarded the contract.

ALASKA'S LARGEST HANGAR IS COMPLETED

Construction on Alaska's largest hangar, 334 ft. long by 353 ft. wide, has been completed at Eielson Air Force Base. The structure, which took 2 yr. to build, was erected by Peter Kiewit Sons' Co. on a $4,078,935 contract.

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TIMBER ROOF CONSTRUCTION PROVES ITSELF FIRE RESISTANT

Intense fire in a San Leandro, Calif., tire shop scorched but did not burn away this Easybow roof truss, which turned out to be highly fire-resistant and provided great structural strength. The heavy timber-laminated structure continued to support the roof and was credited with limiting the damage caused by the fire.

Completion date is around the end of November 1954. Gaasland Co., Inc. of Bellingham, Wash., was low bidder on six large underground waste disposal tanks at Hanford Atomic Energy installation. The sum bid was $1,724,845. United Concrete Pipe Corp. of Baldwin Park, Calif., was low bidder on 23 mi. of laterals and 5 mi. of concrete pipelines and pumping units in Area P-4 of the Columbia Basin Project. The sum bid was $1,063,158.

BIGGER AND BETTER HIGHWAY—U. S. 66 in Tijeras Canyon, New Mexico, has a 7-mi. widening and betterment project scheduled for the spring, according to Art DeLong, a highway department assistant construction engineer. Work scheduled includes widening of shoulders, placing an oil road mat, and overlaying it with asphalt. Present plans call for an outside lane for trucks on hills so automobile traffic will not be held up.

U. S. HIGHWAY 85-87 has been widened into three lanes and resurfaced near Raton Pass at the Colorado-New Mexico state line by the Domenic Leone Construction Co. Work included widening curves and shoulders, oil surfacing, and erection of guard rails.

HOOD CANAL FLOATING BRIDGE—Work has begun on the design plans of the Hood Canal floating bridge, according to Charles Andrew, Washington Toll Bridge Authority consulting engineer. The bridge, which is expected to cost $19,000,000, will consist of a floating structure 6,200 ft. long with fixed spans at each end to allow ships to pass underneath. The bridge will cross the canal between Lofall and South Point in Kitsap County, Washington. The largest span will be a truss structure 648 ft. long at the Lofall end which will provide a 204-ft. clearance over a 40 ft. deep channel. At the other end, a 281 ft. long transition span will connect the floating bridge with the fixed approach structure.

IMPROVEMENTS IN KETCHIKAN—The Ketchikan, Alaska, City Council has gotten together with the Alaska Public Works Agency to provide for street and water projects at a cost of $1,558,000.

SALT LAKE SEWERS—The Salt Lake County Commission has authorized the sale of bonds to finance construction of a sewerage and sewage disposal system. As soon as necessary legal procedures are followed, the construction will be put out to bid. Work is expected to get under way by early spring.

SNOW CONDITIONS on the highways of Nevada and nearby California are being reported promptly by means of two-way radios in snow plows and other winter equipment belonging to the Nevada Highway Department. The department assumed this responsibility to do away with conflicting sources of road information.

WATER IN WYOMING—Plans for two projects to produce an additional 5,000,000 gallons of water per day at a cost of $1,300,000 are being considered by the Cheyenne, Wyoming water board. One plan would involve drilling 16 new wells to the south of the present well field and improving four of the existing wells to produce the required amount of water. An alternate plan would involve construction of a reservoir and pumping station on Dale Creek at a cost of $1,800,000.

PIGEONHOLE GARAGE—A 5-level garage with a capacity for 128 cars has been opened for business in downtown Los Angeles. The $500,000 structure was built on a plot of land 60 x 90 ft. A mobile elevator 20 ft. long carries the cars to the various levels. A mobile lift carries the cars to and from the elevator.

POWER from the first generator, largest of its kind in the world, to go into operation at McNary Dam on the Columbia River started flowing into the Northwest power grid at the rate of 70,000 kw. The 1,422 ft. long powerhouse will eventually hold 14 of these generators. They are all scheduled to be in operation early in 1956, according to Col. F. S. Tandy, Walla Walla district engineer.

THE SEVENTH Northwest Conference on Road Building will be held February 17-19 at the University of Washington in Seattle. The tentative program includes discussions of the highway problem in Oregon and Washington, county road needs, paying for public roads, federal aid in the West, highway engineering progress, aerial surveys, paving and surfacing problems, soil cement, city street problems, freeways, and unusual engineering situations.

NEVADA's Department of Highways awarded a contract to drain, grade, and surface 13.2 mi. of state highway in Nye and Mineral counties to Dodge Construction, Inc. of Fallon, Nev., on a low bid of $189,637. A low bid of $84,218 for construction of a storm drain in Reno was submitted to the City Council by George Miller Construction Co., of Reno, Nev.

HEADWAY ON HOSPITALS—Construction is well under way on four projects which will add 144 hospital beds in four Nevada communities at a total cost of $1,763,516. They include 74 at Reno, 20 beds at Fallon, 18 beds at Yerington, and 50 beds at Las Vegas.

OPENING of a new subway under the American River has relieved a traffic bottleneck between downtown Sacramento, California, and its rapidly growing residential suburb across the river to the east. It will take another year to finish the project, however, according to E. A. Fair-

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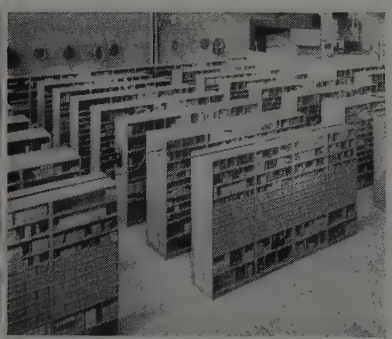

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bairn, city engineer. Item costs on the job, built by A. Teichert & Son, included $450,000 for the new subway; $1,275,000 for connecting roads and ramps including a cloverleaf system; $175,000 for safety lighting; $130,000 for a pedestrian walk and widening the old subway to three lanes.

PASCO SEWER PROGRAM—Pasco, Washington, City Council has approved an ordinance to provide $975,000 for sewer and water-system improvements. It calls for construction of a primary sewage treatment plant, pumping stations, a 5,000,000-gal. capacity concrete reservoir, steel and cast-iron water mains, and a water treatment plant. That part of the funds which is not presently available will be financed by sale of revenue bonds.

ORANGE COUNTY CIVIC CENTER—Ground has been broken on Orange County's multi-million dollar civic center, at Santa Ana, California, where all county activities will eventually be housed. Buildings to be erected include a health center, a welfare department, a hall of records, and a hall of justice.

VANCOUVER FREEWAY—Vancouver, Washington, has opened the first section of the $7,000,000 Vancouver freeway to traffic. This freeway is part of an overall program for improving U. S. 99 planned by the State of Washington.

HIGHWAY COMMUNICATIONS inland from Juneau, Ketchikan, and Wrangell, Alaska, through Canada to connect with the Alaska Highway are being surveyed by the Alaska Road Commission, according to Chief Engineer William J. Niemi. These surveys are under the overall direction of H. D. Thatcher, a highway engineer who has been transferred from the Valdez District to be in charge of all surveys in southeastern Alaska.

GAS LINE BRIDGE—El Paso Natural Gas Co.'s 30-in. gas main crosses the Rio Grande on a new 2,500-ft. steel and concrete suspension bridge hung between two 100 ft. high towers on each bank of the river. The pipeline is being built diagonally across New Mexico from the Lea County oil fields to connect with El Paso's San Juan Basin-to-California pipeline near Gallup. Vinson Construction Co. built the bridge.

DOUBLE GAS STORAGE—A project to double the capacity of gas storage facilities in Sacramento, California, has been started by the Pacific Gas & Electric Co. The work, which will cost an estimated $1,132,000, includes laying 78,000 ft. of 34-in. pipe and increasing compressor capacity from 1,000 to 2,600 hp. This will enable 13,500,000 cu. ft. of gas to be stored in the 20-ac. site of the underground system.

SECOND BARREL of the San Diego aqueduct is rolling right along, according to Jean Walton, project chief, and completion of the project is expected sometime in 1954. Unit bids on the final section of the second barrel can be found on p. 120 of the February 1953 issue of *Western Construction.*

DIVERSION DAM—Construction of the Missouri Diversion Dam, after a year's delay, is planned to start in the spring as soon as bids can be called and awarded. Congress has already appropriated $1,746,000 to begin construction of the dam, a key structure in the Missouri River Basin Reclamation Project, which was designed to supply water for 100,000 acres in northeastern Montana at an estimated cost of $54,254,000. Secretary of the Interior Douglas McKay has given his approval to the project.

ALASKA ENGINEERS EXPANSION—The Seattle branch of the Alaska District, Corps of Engineers, is undergoing expansion under a new policy where plan specifications for military construction jobs in Alaska will be prepared in Seattle. Lt. Col. Edward P. Arnold is in charge of the Seattle office.

WORK HAS BEGUN on the Olympic National Park Heart o' the Hills Highway tunnel near Port Angeles, Washington. The $276,495 contract was awarded to Gibson & Roberts Co., tunnel driving contractors. Dimensions of the tunnel are 350 ft. long, 34 ft. wide, and 14 ft. high.

MORE ALASKA POWER—Exploratory drilling has been completed at the site of a proposed hydroelectric dam near Sitka by the Bureau of Reclamation. The proposed dam would be 160 ft. high and impound 90,000 acre-feet of water which would run through a power plant capable of generating 11,000 kw. The dam would be at Blue Lake. The set of 17 test borings at the dam site was drilled under supervision of Leslie H. Abernathy, USBR engineer.

ROUGH GRADING on relocation of the Blewett Pass Highway near Ellensburg, Washington, is almost finished, according to C. E. Oneal Co., Inc., the job contractor. Work on the Oneal contract includes channeling of Swauk Creek, rough grading, and placing of cushion rock.

SURPLUS WATER from the Albeni Falls Dam reservoir has been released in an unregulated flow to benefit the power plants on the Columbia River, according to Col. N. A. Matthias, Seattle district engineer for the Corps of Engineers. The Albeni Falls powerhouse is scheduled to begin producing power by January 1955.

OCEANSIDE FREEWAY — The Oceanside-Carlsbad freeway in Southern California has been opened to traffic. It has four 12 ft. wide cement lanes on slabs 8 in. thick. It is capable of accommodating six lanes of traffic in the future. The 10.7 mi. long project was built at a cost of $7,500,000. Another $2,000,000 was spent in purchasing rights of way. Ralph A. Lejonhud was project engineer on the job.

BROADWAY TUNNEL ILLUMINATION WINS FIRST PRIZE

The illumination of San Francisco's 1,616 ft. long Broadway Tunnel (construction described in *Western Construction*—April 1952, pp. 70-73) has won first prize in a nationwide contest sponsored by the Illuminating Engineering Society. Merrill R. Humber, of Humber and Walker Co., worked on the design in cooperation with Ivan Sandberg, chief electrical engineer of the San Francisco Department of Public Works.

ALASKA Newsletter

By CLIFFORD S. CERNICK, Anchorage

NO PIPE DREAM, THIS—Alaska's biggest pipe-laying project is now under way with the breaking of ground for the $29,000,000 Haines-Fairbanks multiple petroleum pipeline, largest such project ever undertaken in the north. Pipeline's 50-ft. right-of-way traverses rugged Yukon wilderness, canyons, rivers, miles of swamplands. In 1956, Uncle Sam hopes to have the project completed, and a "river" of fuel flowing north through a terrain dotted with mile-high mountains and frozen lakes. Much of the line must be laid over perpetually frozen subsoil. Right now, work crews are hacking away at the frozen wilderness clearing right-of-way.

ARMY OF WORKERS will move north early next spring to push the Haines-Fairbanks pipeline through before its completion date of September 1955. Virtually all categories of construction stiffs will be turned loose on the herculean task of stringing 621 mi. of 8⅝-in. (outside diameter) seamless steel pipeline. And that's not all—a wharf must be built at Haines strong enough to take the heavy pounding of heavy cargo; a network of five pumping stations must be erected—three in Canada and two in Alaska—and two tank farms complete with terminal facilities must be built in Fairbanks.

A TIP FOR PIPELINE JOB-SEEKERS: Don't make mistake of rushing to Alaska to seek job on big pipeline. Best bet is to contact one of the three firms who were awarded the district engineer contract as a joint venture. The firms are Williams Brothers Construction Co. of Tulsa, Oklahoma; McLaughlin, Inc., of Great Falls, Montana, and the Marwell Construction Co. of Vancouver, B. C. Don't get impatient either—the bulk of the hiring won't begin until late February, early March or later.

HAS BIG HIKE AHEAD—Major John E. England of the Fairbanks office, Corps of Engineers, has been appointed resident engineer for the pipeline project. He has announced he will make a personal inspection—mile by mile—of the pipeline route, with much of it on foot. The line will carry fuel from tidewater at Haines through the Yukon and Alaska interior to Fairbanks terminal.

HOUSING OFFICIALS ON HOT SEAT—Alaska's territorial examination and investigative committee, set up during the last session of legislature, has been probing the Alaska Housing Authority, a territorial agency. Probe will be concerned with charges levelled at AHA by Alaska legislators to the effect that AHA approved loans in excess of actual construction costs and accepted substandard material for construction. AHA is charged, also, with accepting excessive land appraisals as a basis for loans to promoters who were thus enabled "to start large projects with small cash investments."

$3,559,200 QUESTION — Questions fired at AHA officials during probe hearing in Anchorage federal courtroom included: (1) Why did AHA approve a $3,559,200 loan to an Anchorage construction firm when the firm's total assets amounted to only $36,000? (2) Why did AHA permit contractors in Anchorage to delete footings on 252 houses? (3) Why did a group of construction firms receive approval for loans on lumber priced at $20 per ft. when other firms were paying only $15 per ft.?

BIG CONSTRUCTION POW-WOW—Eyes of Alaskan construction workers are on labor-management pow-wows currently taking place in Seattle between the Associated General Contractors and representatives of laborers, teamsters, operating engineers, ironworkers, cement masons, plasterers, lathers and bricklayers. Labor unions this year as last seem less inclined to go on warpath for higher wages, and early reports from Seattle indicate both sides are puffing "pipe of peace." This may insure a trouble-free Alaska construction season in 1954, with wage levels close to those currently prevailing. Alaska carpenters traditionally hold separate wage talks with contractors. As of now, there's no indication here as to how they'll come out. The carpenter negotiations will be in Alaska.

GLOOMY JOB PICTURE—Alaska employment officials report mounting unemployment as mercury dips even lower. Cold hand of winter has choked off most jobs in the out-of-doors, with contractors' construction activity virtually at a standstill except for some inside work on housing projects. Typical of the job freeze is the acute unemployment existing in Anchorage. Employment officials here say their office has been "swamped" by job-seekers—more than 2,309 of them seeking work in Anchorage alone. This is several hundred more than were unemployed last year at this time. Here's the breakdown on construction crafts hardest hit by winter's relentless shutdown of major projects: Worst off are carpenters and laborers, with 366 of the former seeking jobs and 207 of the latter out of work. Also pounding the pavements in Anchorage: 143 truck drivers, 67 heavy equipment operators, 78 plumbers, 53 heavy equipment mechanics, 40 painters and 21 electricians.

CLOUD'S SILVER LINING—Saying that "it's always darkest before the dawn" applies to Alaska unemployment. If Alaskans can weather the long winter without running out of sourdough and beans, the Alaska District Engineer will probably have jobs for big share of the unemployed. Col. L. H. Foote, army's district engineer here, promises that 1954 will be "a big year" for military construction in Alaska, especially in the Anchorage area. A total of $202,000,000 worth of work still remains to be completed. Of this amount, Anchorage, Whittier and Kenai will get $80,000,000.

MANY-SIDED APPROPRIATIONS PICTURE — While some government agencies report they anticipate no slash in appropriations for Alaska construction in 1954, others indicate they fear drastic chopping by budget axe. Alaska's Delegate E. L. (Bob) Bartlett reports that Department of Interior appropriations are likely to undergo at least a 25% slash in the next fiscal year. Bartlett says the $14,600,000 allocated for road construction this year probably will be reduced to about $10,000,000 this year. Severity of fund cuts is reflected in plight of Alaska Road Commission, which faces slash from current road maintenance allocation of $3,000,000 to about $2,600,000 next year. Road Commission has insisted that $3,000,000 is "absolute minimum" required for adequate maintenance of Alaska's roads.

CONSTRUCTION CAPSULES — A pillar of concrete as high as Mt. McKinley and a little over a mile each way on the ground would represent the amount of ready-mix concrete sold in Fairbanks area for building purposes last construction season . . . Fur-clad college students can look forward to dining in $600,000 student food service building on which construction will begin next summer at the University of Alaska campus near Fairbanks . . . Two big mills are still being considered for construction in Alaska—one, on which plans have already "jelled" is a $4,502,570 sawmill near Wrangell—the other, still "up in the air" is the $40,000,000 pulp mill proposal for the Sitka area being urged by Japanese interests . . . Fishing interests are showing vigorous opposition to proposal of the Harvey Aluminum Co. for construction of big power dam on Copper River near Cordova. Fish and Wildlife service estimates dam would destroy 90% of present Copper River salmon run, now worth $3,000,000 to $5,000,000 annually.

UNIT PRICES

Selected abstracts for Western projects

TUNNEL—2,300-ft. Camino Tunnel with a 7-ft. diameter horseshoe section

California—Central Valley Project—USBR. T. E. Connolly, Inc., San Francisco, won an award from the Bureau of Reclamation on the basis of a low bid of $322,910 for Schedule 1A, construction of Camino Tunnel with a 7-ft. diameter horseshoe-shaped section. This work is in conjunction with construction of Camino Conduit. Unit prices were as follows:

(1) T. E. Connolly, Inc.	$322,910
(2) Morrison-Knudsen Co., Inc.	391,596
Stolte, Inc.	448,307
Macco Corp.	468,620
Fredrickson & Watson Construction Co. and M & K Corp.	488,427
Wixson & Crowe, Inc.	509,790
G. L. Tarlton Contracting Co.	532,136
L. E. Dixon Co.	631,465
Engineer's estimate	341,855

		(1)	(2)
2,900	cu. yd. excavation in open cut	3.50	3.00
4,900	cu. yd. excavation in tunnel	43.00	45.00
100	cu. yd. excavation for tunnel enlargement	5.00	51.50
420	cu. yd. backfill	1.00	1.30
45	cu. yd. compacting backfill	4.00	4.30
6,000	lb. furn. and install. perm. steel tunnel supports	.12	.27
18	m.b.m. furn. and erect. perm. timbering in tunnel	100.00	177.00
1,400	lin. ft. furn. and install. tunnel roof support bolts	1.00	1.95
250	lin. ft. drilling feeler or pilot holes ahead of tunnel excav.	1.00	2.60
250	lin. ft. drilling grout holes through conc. tunnel lining	3.00	2.60
400	lb. furn. and placing grout pipe and connections	3.00	.65
1,250	cu. ft. pressure grouting	1.50	3.85
125	cu. yd. concrete in structure	80.00	97.00
1,250	cu. yd. concrete in tunnel lining	52.00	85.50
2,100	bbl. furnishing and handling cement	4.50	5.70
12,700	lb. furn. and placing reinf. bars in structures	.20	.14
175	lin. ft. placing rubber water stops in joints	3.00	2.00
1,250	lb. furn. and install. weep pipes in tunnel lining	1.00	1.00
200	lb. furn. and install. miscl. metalwork	3.00	.75

MISCELLANEOUS—Crushing and stockpiling crushed gravel surfacing

Wyoming—Various counties—State. Gilpstrick Construction Co., Riverton, was awarded a contract by the Staate Highway Department on the basis of a low bid of $18,960 for crushing and stockpiling crushed gravel surfacing at various locations in Park, Big Horn and Washakie counties. Unit prices were as follows:

(1) Gilpstrick Construction Co.	$18,960
(2) W. E. Barling, Inc.	21,290
Taggart Construction Co.	21,600
Wyoming Improvement Co.	25,895
Big Horn Construction Co.	27,150
Engineer's estimate	21,875

		(1)	(2)
5,000	ton crushed gravel surfacing (⅝-in. max.)	.79	.87
2,500	ton crushed gravel surfacing (⅝-in. max.)	.79	.93
5,000	ton crushed gravel surfacing (⅝-in. max.)	.79	.85
3,500	ton crushed gravel surfacing (⅝-in. max.)	.79	.85
5,000	ton crushed gravel surfacing (⅝-in. max.)	.79	.92
3,000	ton crushed gravel surfacing (⅝-in. max.)	.79	.93

CANAL—Earthwork, asphaltic membrane lining and structures for Fort Laramie Canal

Wyoming—North Platte Project—USBR. Lichty Construction Co., Riverton, submitted a low bid of $259,462 for Schedules 1 and 2, earthwork, asphaltic membrane lining and structures for Fort Laramie Canal. Schedule 1 involves work from stations 1531+00 to 1589+00; 1765+47 to 1830+00, and 2043+46 to 2070+00. Schedule 2, from stations 4509+20 to 4562+00; 5518+00 to 5534+00; 5900+00 to 5919+85; 6125+00 to 6165+00; drainage inlet at Station 6190+96, and Station 6199+00 to 6223+12.3. Unit prices were as follows:

	Schedule 1	Schedule 2
(1) Lichty Construction Co.	$146,549	$112,913
(2) Harry F. Berggren & Sons, Inc.	none	106,318
(3) Studer Construction Co.	162,376	106,949
L. H. Weber	169,519	none
Peter Kiewit Sons' Co.	176,439	112.765
Long Construction Co., Inc.	188,983	122,891
Engineer's estimate	205,487	140,171

Schedule 1		(1)	(3)
87,200	cu. yd. canal excavation	.30	.34
10,000	cu. yd. excavation, borrow	.30	.40
28,600	sta. cu. yd. overhaul	.02	.01
11,100	cu. yd. compacted fill	.60	.80
480,000	sq. yd. dragging	.015	.02
193,500	sq. yd. rolling	.03	.02
42	M. gal. sprinkling subgrade	20.00	20.00
1,060	ton furn. and apply. asph. for membrane lining	49.00	52.80
46,200	cu. yd. placing earth cov. matl. on membr. lining	.30	.28
86,000	mi. cu. yd. loading and hauling gravel fill	.17	.16
25,200	cu. yd. placing gravel blankets	.26	.44
1	struct. constr. drain. inlet struct. with Q—30 cfs.	$1,125	$1,100
1	struct. constr. drain. inlet struct. with Q—60 cfs.	$1,615	$1,600
4,400	cu. yd. hauling and placing riprap	1.50	2.00

Schedule 2		(1)	(2)
46,000	cu. yd. canal excavation	.36	.38
4,000	cu. yd. excavation, borrow	.40	.28
17,700	sta. cu. yd. overhaul	.03	.02
4,300	cu. yd. compacted fill	.75	.25
266,300	sq. yd. dragging	.02	.01
118,200	sq. yd. rolling	.04	.02
25	M. gal. sprinkling subgrade	25.00	20.00
610	ton furn. and applying asph. for membrane lining	51.00	52.00
28,800	cu. yd. plac. earth cover matl. on membrane lining	.30	.35
118,400	mi. cu. yd. loading and hauling gravel fill	.17	.16
10,770	cu. yd. placing gravel blankets	.28	.32
3	struct. constr. drain. inlet struct. with Q—30 cfs.	$1,255	967.00
2	struct. constr. drain. inlet struct. with Q—60 cfs.	$1,700	$1,569
4	struct. constr. drain. inlet struct. with Q—100 cfs.	$1,800	$1,823
360	cu. yd. furn. and placing riprap	8.50	9.00

HIGHWAY—Heavy grading on the Pacific Highway

Oregon—Douglas County—State. Parker-Schram Co., Portland, was awarded a contract by the State Highway Department on the basis of a low bid of $479,406 for 3.2 mi. of grading and draining on the Fairgrounds-Shady unit, Deady-Shady section of the Pacific Highway. Unit prices were as follows:

(1) Parker-Schram Co.	$479,406
(2) C. R. O'Neil	480,637
Miller & Strong, Inc.	487,937
Funderburk Construction Co.	500,724
J. G. Watts	513,191
McNutt Bros.	601,522
J. N. Conley	601,611
Kuckenberg Construction Co., Inc.	605,914
Fred H. Slate Co., Oregon, Ltd., and E. C. Hall Co.	620,052
Babler Bros., Inc.	623,266
Natt McDougall Co.	626,778
Central Heating Co., Oregon, Ltd. and F. L. Somers	696,415
White Bros. Co.	718,405
Gibbons & Reed Co.	722,480
McCammon-Wunderlich Co.	814,341

		(1)	(2)
All spec.	clearing and grubbing	$22,500	$25,000
3,740	sq. yd. removal of pavement	.50	1.00
850	cu. yd. structural excav., unclassified	3.60	4.00
180	cu. yd. trench excav., unclassified	2.50	3.00
588,600	cu. yd. general excav., unclassified	.57	.55
2,174,000	yd. sta. short overhaul	.01	.015
45,500	cu. yd. sta. long overhaul	.50	.50
3.26	mi. finishing roadbed and slopes	750.00	$1,000
14,900	lin. ft. rounding cutbanks	.15	.15
50	lin. ft. 24-in. half-circle CMP	4.15	3.20
170	lin. ft. 60-in. CMP, protected invert	34.50	32.00
200	lin. ft. 72-in. CMP, protected invert	41.00	38.00
100	lin. ft. 84-in. CMP, uncoated	52.50	47.00
220	lin. ft. 90-in. structural plate pipe	60.00	50.00
140	lin. ft. 6-in. metal drain pipe, coated	1.60	1.90
820	lin. ft. 6-in. perforated metal drain pipe, coated	1.65	2.00
130	cu. yd. ⅜-in. - 0 backfill in drains	5.00	5.00
30	lin. ft. 12-in. concrete pipe	2.10	2.00
1,200	lin. ft. 18-in. concrete pipe	3.95	4.00
130	lin. ft. 24-in. concrete pipe	5.50	5.00
430	lin. ft. 30-in. concrete pipe	7.00	7.50
250	lin. ft. 36-in. concrete pipe, extra strength	10.00	9.50
1	only concrete catch basins	75.00	250.00
180	cu. yd. Class "A" concrete	58.00	60.00
30,300	lb. metal reinforcement	.14	.12
680	ton Class "B" asphaltic concrete	9.00	9.00

HIGHWAY—3.7 mi. of grading and draining in Arizona

Arizona—Apache County—State. Royden Construction Co., Phoenix, submitted a low bid of $184,153 before the State Highway Department for 3.7 mi. of grading and draining over new alignments and furnishing and placing select material over the easterly section. Work is on two sections of U. S. 263 between Concho and St. Johns. Unit bids submitted were as follows:

(1) Royden Construction Co.	$184,153
(2) Isbell Construction Co.	191,903
Tanner Bros.	205,056
Larsen Construction Co.	207,247
Kolob Construction Co.	212,396
D. A. Flickinger	214,670
Lyle Price	216,853
Givens Construction Co.	219,159
Vinnell Co., Inc.	222,222
M. M. Sundt Construction Co.	235,944
Fisher Contracting Co.	240,958
Phoenix-Tempe Stone Co.	252,950

		(1)	(2)
152,500	cu. yd. roadway excavation	.58	.57
2,120	cu. yd. drainage excavation	.60	1.10
9,010	lin. ft. grader ditches	.06	.10
2,530	lin. ft. crown ditches	.20	.25
1,150	lin. ft. placing crown ditches	.20	.35
1,300	cu. yd. structure excavation	3.00	2.75
3,500	cu. yd. mi. overhaul	.40	.25
1	lump sum provide water supply	$1,000	$1,000
4,625	M. gal. apply water (CIP)	.75	1.25
1,055	hr. rolling	8.00	8.50

(Continued on next page)

UNIT PRICES

		(1)	(2)
4,100	ton select material (CIP)	1.25	1.10
679	cu. yd. Class A concrete (incl. cement)	50.00	55.00
73,855	lb. reinforcing steel (bars) (CIP)	.13	.14
812	lin. ft. 24-in. C.M.P. (CIP except excav.)	6.00	6.25
94	lin. ft. 30-in. C.M.P. (CIP except excav.)	7.00	7.50
300	lin. ft. 36-in. C.M.P. (CIP except excav.)	12.00	11.25
108	lin. ft. 42-in. C.M.P. (CIP except excav.)	14.00	14.00
156	lin. ft. 48-in. C.M.P. (CIP except excav.)	17.00	16.50
94	lin. ft. 60-in. C.M.P. (CIP except excav.)	28.00	26.00
5	cu. yd. removal of structure concrete	25.00	35.00
1	ea. cattle guard (4-unit) (std. C-14) (CIP except excav. and concrete)	$1,350	$2,200
28	ea. r/w markers (std. C-1) (Type B or C) (CIP)	8.50	9.00
22,308	lin. ft. line fence (std. C-15 or C-16) (CIP)	.22	.26
2	ea. steel fence gate (Type #1) (std. C-15 or C-16) (CIP)	60.00	65.00
14,900	lin. ft. reconstruct fence	.22	.25
1	ea. irrig. standpipe (std. C-31) (Type #2) (CIP)	325.00	350.00

HIGHWAY—8.9 miles of road-mixed bituminous surfacing

Idaho—Madison and Fremont counties—State. Marion J. Hess, Malad, with a low bid of $132,498, was awarded a contract by the State Department of Highways for constructing the roadbed and road-mixed bituminous surfacing on 6.7 mi. of the Parker-Thornton road, Burton Loop section, and 2.2 mi. of road-mixed bituminous surfacing on the Moody road. Unit prices were as follows:

(1)	Marion J. Hess $132,498
(2)	Carl E. Nelson 134,482
	Western Construction Co. 134,938
	Burggraf Construction Co. 138,405
	Barnhart & Wheeler 144,261
	Peter Kiewit Sons' Co. 156,426
	Mountain State Construction Co. 162,524

		(1)	(2)
4	ea. removal of culvert	100.00	300.00
3	ea. remove concrete headwalls	20.00	20.00
2	ea. remove masonry headwalls	30.00	75.00
2,800	cu. yd. unclassified excav.	.50	.60
935	cu. yd. excav. for structs.	2.50	3.00
19,900	cu. yd. borrow	.30	.35
11,000	cu. yd. selected borrow, Class "A"	.60	.65
18,200	yd. mi. haul	.25	.25
780	M. gal. watering embankments	1.50	2.00
1,490	M. gal. water base and surf. courses	1.50	2.00
332	hr. rolling power roller	6.00	6.00
368	hr. rolling pneumatic tired roller	6.00	5.00
390	cu. yd. mechanical tamping	2.00	2.50
6,248	mi. recond. exist. rdbd., Class "A"	250.00	200.00
31,200	ton cr. gr. surf. course ¾-in. max.	.80	.80
12,850	tons cr. gr. in windrows ¾-in. max.	.75	.78
38,330	gal. MC-1 asph. rd. matl. for prime	.155	.145
965	ton blotter matl., Class "B"	.50	1.00
8.967	mi. mix., finish and roll, Class "A"	700.00	600.00
473	ton SC-3 asph. rd. matl. for rdmix.	.34	.34
695	tons mix and place bitu. surf. appr. roads	5.00	5.00
30,500	gals. MC-4 asph. road matl. for seal	.155	.15
1,830	ton cover coat matl., Class "3"	3.25	3.50
183	cu. yd. concrete, Class "A"	70.00	62.50
22,200	lb. metal reinforcement	.16	.14
75	lin. ft. steel beam H rail., conc. strs. (10 ga.)	4.00	4.00
972	lin. ft. 12-in. pipe culverts	2.25	2.25
490	lin. ft. 18-in. pipe culverts	3.50	3.25
60	lin. ft. 24-in. pipe culverts	5.00	5.25
60	lin. ft. 36-in. pipe culverts	10.00	9.25
84	lin. ft. 22-in. x 13-in. arch type CMP	3.75	4.50
90	lin. ft. 29-in. x 18-in. arch type CMP	5.50	6.00
60	lin. ft. 50-in. x 31-in. arch type CMP	12.00	14.00
65	ea. guide posts, Type "3"	10.00	10.00

BRIDGE—Redecking a bridge with precast PCC deck units

California—Fresno County—State. Friant Construction Co., Fresno, submitted a low bid of $37,788 before the Division of Highways for redecking a bridge across Kings River overflow with precast PCC deck units, constructing a detour and widening approaches. Work is located about 17 mi. east of Fresno. Unit prices were as follows:

(1)	Friant Construction Co. $37,788
(2)	Paul E. Woof 44,146

		(1)	(2)
	Lump sum, removing existing brush	$1,055	$3,900
	Lump sum, clearing and grubbing	$1,000	$1,500
210	cu. yd. structure excav.	4.00	3.00
1,400	cu. yd. imp. borrow	1.65	1.50
	Lump sum, dev. wat. sup. and furn. wat. equip.	160.00	$1,900
90	M. gal. applying water	2.50	1.00
1,200	sq. yd. prepar., mix. and shap. surface (B.S.T.)	.50	.30
11	ton liquid asph., SC-3 or SC-4 (B.S.T.)	40.00	40.00
110	ton P.M.S.	6.50	10.00
158	cu. yd. Cl. "A" P.C.C. (deck units)	105.00	91.00
45	ea. guide posts	7.00	7.00
22	cu. yd. Cl. "A" P.C.C. (struct.)	60.00	60.00
240	lin. ft. 48-in. C.M.P. (12 ga.)	15.50	20.00
240	lin. ft. salvag. 48-in. C.M.P.	1.00	3.00
63,000	lb. bar reinf. steel	.10	.10
326	lin. ft. corrugated metal br. railing	5.70	5.50
	Lump sum, obliterating detour	100.00	$2,500

CANAL—Earthwork, concrete canal lining and structures

Washington—Yakima Project—USBR. A. J. Cheff Construction Co., Seattle, submitted a low bid of $272,546 before the Bureau of Reclamation for construction of earthwork, concrete canal lining and structures for the Main Canal, Kennewick Division. Work is from Station 0+61.1 (AH) to 114+70 and Station 246+75 to 249+00. Unit prices were as follows:

(1)	A. J. Cheff Construction Co. $272,546
(2)	J. A. Terteling & Sons 294,353
	Cherf Bros. Construction Co. & Sandkay Contractors, Inc. 294,856
	Long Construction Co., Inc. 298,888
	Otis Williams & Co. 329,171
	Engineer's estimate 284,345

		(1)	(2)
100,300	cu. yd. excavation, common, for canal	.60	.33
20,100	cu. yd. excavation, rock, for canal	.60	1.40
3,000	cu. yd. excavation from borrow	.25	.33
2,500	mi. cu. yd. overhaul	.30	.47
14,300	cu. yd. compacting embankment	.22	.32
2,650	cu. yd. excav., common, for structures	.60	1.40
10	cu. yd. excav., rock, for structures	4.50	6.70
26,625	sq. yd. prep. rock founda. for conc. canal lining	.90	1.27
17,750	sq. yd. trim. earth founda. for conc. canal lining	.44	1.27
1,635	cu. yd. backfill about structures	.38	.40
1,460	cu. yd. compacting backfill about structures	2.00	3.35
5	cu. yd. riprap	8.00	6.70
250	cu. yd. gravel canal lining	5.90	10.90
165	sq. yd. permanent surfacing at siphon crossing	3.60	13.45
200	cu. yd. concrete in structures	90.00	80.70
3,716	cu. yd. concrete in canal lining	18.00	19.00
5,500	bbl. furn. and handling cement	5.70	6.43
57,280	lb. furn. and placing reinf. bars	.14	.14
620	sq. ft. furn. and plac. ½-in. elastic filler in joints	2.44	2.35
3	ea. furn. and placing tapered units for manholes	150.00	47.00
38	lin. ft. furn. and erecting 48-in. diam. conc. pipe	22.00	27.45
1,440	lin. ft. placing 6-in. rubber water stops in joints	1.00	.90
179	lin. ft. placing 9-in. rubber water stops in joints	1.00	1.20
11.0	M.b.m. furn. and erecting untr. timber in structs.	240.00	255.55
1.2	M.b.m. furn. and erect. treated timber in structs.	500.00	343.00
700	sq. ft. furn. and placing asph. plank in bridge floor	1.11	2.60
194	lin. ft. furn. and laying 12-in. diam. HC50 precast-reinf.-conc. pipe	4.00	2.80
50	lin. ft. furn. and laying 15-in. diam. HC50 precast-reinf.-conc. pipe	5.50	5.65
504	lin. ft. furn. and laying 18-in. diam. HC50 precast-reinf.-conc. pipe	7.50	6.60
400	M. gal. furn. water for testing canal section, first 400 M. gallons	15.50	10.00
2,000	M. gal. furn. water for testing canal section over 400 M. gallons	1.60	.90
	Lump sum, installing and removing welded steel pipe and furn., install., and remov. other matls. for test section drain	$2,800	$1,883
600	lb. furn. and install. metal slide gates	.55	1.00
1,100	lb. furn. and install. safety ladders	.50	.60

HIGHWAY—Grading and plant-mixed surfacing on cement-treated base

California—Fresno County—State. Rice Bros., Inc., Marysville, submitted a low bid of $195,104 before the Division of Highways for about 5.3 mi. of grading and plant-mixed surfacing on cement treated base on Clovis Ave., between St. 4 and Columbia Ave. (S). Unit prices were as follows:

(1)	Rice Bros., Inc. $195,104
(2)	Stewart & Nuss 195,493
	Gene Richards, Inc. 199,487
	Volpa Bros. 208,176
	Baun Construction Co. 217,834
	Clements Construction Co. 221,582
	G. W. Ellis Construction Co. 227,288
	M. J. Ruddy & Son 231,653
	Harms Bros. 245,569
	Gordon H. Ball & San Ramon Valley Land Co. 267,735
	A. G. Raisch Co. 270,124

		(1)	(2)
26	cu. yd. remov. concrete	4.54	5.00
	Lump sum, clearing and grubbing	$6,400	$2,500
11,250	cu. yd. roadway excav.	.47	.45
625	cu. yd. struct. excav.	3.15	3.70
83,000	cu. yd. I.B.M.	.70	.52
52,000	sq. yd. scarify. exist. surfac.	.02	.0175
	Lump sum, dev. wat. sup. and furn. wat. equip.	$3,634	$14,150
10,900	M. gal. applying water	.95	1.10
279	sta. finishing rdwy.	11.00	5.00
2,050	bbl. portland cement (C.T.B.)	5.20	4.60
100,250	sq. yd. mix., spread., and compact. C.T.B.	.06	.09
100	ton liq. asph. MC-2 (pr. ct.)	32.00	27.50
15,900	ton min. aggr. (P.M.S.)	3.70	4.15
795	ton pav. asph. (P.M.S.)	22.60	23.00
17	ton asph. emul. (Cl. "C-Med." sl. ct.)	38.00	50.00
210	ton screen. (Cl. "C-Med." sl. ct.)	6.65	6.00
33	cu. yd. Cl. "A" P.C.C. (struct.)	52.00	75.00
2,000	lb. bar reinf. steel	.20	.15
120	lin. ft. 18-in. reinf. conc. pipe	5.90	3.90
120	lin. ft. 30-in. reinf. conc. pipe	12.50	6.00
56	lin. ft. 42-in. reinf. conc. pipe	18.70	10.30
120	lin. ft. 12-in. C.M.P. (16 ga.)	2.86	2.25
70	lin. ft. 18-in. C.M.P. (16 ga.)	3.50	3.00
3	lin. ft. 6-in. non-reinf. conc. irrig. pipe	1.00	1.00
31	lin. ft. 12-in. non-reinf. conc. irrig. pipe	1.25	1.25
9	lin. ft. 14-in. non-reinf. conc. irrig. pipe	1.30	1.25
3	lin. ft. 16-in. non-reinf. conc. irrig. pipe	2.00	2.00
12	lin. ft. 18-in. non-reinf. conc. irrig. pipe	2.25	2.00
	Lump sum, salv. and reinstall. irrig. facilities	112.00	750.00
4	ea. install. circular slide head gates	40.00	100.00

Big Payloads...

ANOTHER ADVANTAGE OF BUCYRUS-ERIE INDIVIDUAL DESIGN

BUCYRUS ERIE

With Bucyrus-Erie Individual Design you get the smooth coordination of hoist, crowd, and swing that assures big payloads on every pass. The operator, working with easily manipulated, responsive controls, finds it easy to heap the dipper, easy to keep those big loads coming all through the shift.

That's because each machine in the Bucyrus-Erie ⅜- to 4-cu. yd. line is designed from the ground up to handle its rated capacity most efficiently. There are no oversize or undersize dippers used to make "different" models. With Individual Design, speed, power, strength and weight are all properly proportioned, and the machine works most efficiently as a whole.

See your Bucyrus-Erie Distributor soon. He'll show you the other great advantages of Individual Design — fast work cycles, low maintenance, long machine life, low operating costs.

22E53

YOUR BUCYRUS-ERIE DISTRIBUTOR is a good man to know. He is widely experienced in the construction field . . . and his experience is at your service anytime.

BUCYRUS-ERIE COMPANY

SOUTH MILWAUKEE
WISCONSIN

INDIVIDUAL DESIGN . . . for each model in the line

SEE YOUR BUCYRUS ERIE DISTRIBUTOR

BORDER MACHINERY COMPANY — El Paso, Texas	THE LANG COMPANY — Salt Lake City, Utah
CLYDE EQUIPMENT COMPANY — Portland & Seattle	INTERMOUNTAIN EQUIPMENT CO. — Boise, Pocatello, Spokane
THE COLORADO BUILDERS' SUPPLY COMPANY — Denver, Colo.	THE MERRILL-BROSE COMPANY — Oakland, Calif.
CROOK COMPANY — Los Angeles, Calif.	NEVADA EQUIPMENT SERVICE — Reno, Nevada
GREAT NORTHERN TOOL & SUPPLY CO. — Billings, Mont.	NORTHERN COMMERCIAL COMPANY — Seattle, Wash.
R. L. HARRISON COMPANY, INC. — Albuquerque, N. M.	STATE TRACTOR & EQUIPMENT COMPANY — Phoenix, Ariz.

WESTMONT TRACTOR & EQUIPMENT COMPANY, Missoula & Kalispell, Montana

EXC-4

SHOVELS • DRAGSHOVELS • DRAGLINES • CLAMSHELLS • CRANES

ENGINEERS on the move

The following comprise the membership of the Board of Consultants retained by the Water Project Authority of the State of California to consider the scope of the investigation of a proposed salt water barrier in the San Francisco Bay area: Chairman, **Raymond A. Hill** of Leeds, Hill & Jewett, consulting engineers of Los Angeles; **Hans Kramer,** Brig. Gen., USA (Ret.), now associated with Sverdrup & Parcel, San Francisco; **Philip C. Rutledge** of Moran, Proctor, Meuser & Rutledge, New York consultants; **Charles E. DeLeuw,** president of DeLeuw, Cather & Co., Chicago, and **Malcolm Pirnie, Jr.,** senior member of Malcolm Pirnie Engineers, New York.

Harlan H. Edwards, **new president, Seattle Section, ASCE**

Harlan H. Edwards was elected president of Seattle Section, American Society of Civil Engineers, to serve through 1954. **Emil C. Jensen** was named vice president; **Richard H. Meese,** secretary, and **Rolf B. Beck,** treasurer.

Louis J. Roberts has returned from Alaska, where he was engaged in cartography for the U. S. Geological Survey, sometimes making use of helicopters in mapping an area between the Yukon River and McKinley Park. He is now on a mapping project in eastern Texas for the Geological Survey.

Dave Maddox, field engineer for the Apache Powder Co., recently retired from active service with the company.

Recent personnel changes at Kaiser Engineers involve the transfer to New York of **Maurice Nicholls** from the firm's Oakland, Calif., office. Nicholls has been consulting engineer and active in development work. On his new assignment he will be in charge of development of engineering and construction projects for Kaiser Engineers on the Eastern seaboard. Another change was the departure of **C. H. Case** for Tokio, where he will be an industrial and technical consultant on a survey team from International Bank for Reconstruction and Development. He is on loan from Kaiser, where he is assistant division manager.

George J. Hoge, Great Falls, a Bureau of Reclamation engineer, was elected president of Montana Section, American Society of Civil Engineers, at its annual meeting. Other officers elected are: **O. C. Redy** of Billings, vice president for the Billings branch; **Harold L. Fagle** of Helena, vice president for Helena branch; **Donald R. Cubbage** of Great Falls, vice president for North Central branch. **Lucy W. Pettapiece,** Great Falls, is secretary-treasurer.

W. R. Grenier recently resigned as acting city engineer of Riverton, Wyo., and asked the town council to withdraw his application for permanent appointment to the position. He is a member of the Joe T. Banner engineering firm at Laramie.

James Kezer, chief of operations and maintenance at the South Platte district of the Bureau of Reclamation in Colorado, was recently given an "efficiency award" for an estimated saving to the Government of $45,000 on the Colorado-Big Thompson project.

W. H. Lynch, division engineer of the Bureau of Public Roads at Portland, Ore., retired January 1 and is succeeded by **Hugh A. Stoddard,** the Bureau's division engineer in Juneau, Alaska. Simultaneously it was announced that the Juneau division office will be reduced to district level.

R. W. Haselwood, who was recently appointed city engineer of Anchorage, Alaska, has resigned the position.

Four engineering students from the University of Colorado and four from Colorado A. & M. College were recently awarded scholarships by the Colorado Contractors Assn., Inc. Those receiving the scholarships were: **James Coffey, Addison Smith, R. J. Warren** and **Donald Danielson** of U. of Colorado, and **James Bell, Gerald McRae, Phil Pratt** and **Deryl Gingery** of Colorado A. & M.

Putnam R. Warwick has been named city engineer of National City, Calif.

A. P. Beiser, formerly employed by Kaiser Aluminum & Chemical Corp., is now field engineer for Rothschild, Raffin & Weirick on this company's contract for reconstruction and new construction at the state hospital in Stockton, Calif.

Sterling S. Green **now heads Los Angeles Section, ASCE**

Sterling S. Green of the Los Angeles Department of Water and Power is the new president for 1954 of Los Angeles Section, American Society of Civil Engineers. **Ralph W. Spencer,** Southern California Edison Co., and **Walter B. Hollingworth,** City of Vernon, were elected vice presidents; **C. Martin Duke** of the University of California, secretary; and **Gilbert W. Outland,** Los Angeles County Flood Control District, treasurer.

Tom Lyon has joined Southwestern Engineering Co., Los Angeles, as a consulting engineer.

Maj. John E. England of the Alaska District, Corps of Engineers, has been appointed to represent the Corps of Engineers in construction of the Haines to Fairbanks multi-million dollar pipeline. The announcement was made by **Col. L. H. Foote,** Alaska District Engineer, at the recent annual conference of District-Resident Engineers in Anchorage. In addition to Col. Foote and Maj. England, others attending the conference were: **Lt. Col. Edward P. Arnold,** officer-in-charge of the Seattle Branch; **Lt. Col. Robert E. Hislo,** resident engineer of Elmendorf AFB and Fort Richardson, and his assistant **Edward A. Smith; Maj. Don H. Dragoo,** representing **Col. J. L. Addison,** resident engineer of Ladd-Eielson AFB, and his assistant **Elmer F. Munger; Robert E. Lyle,** resident engineer for Big Delta, and **Norman Sundby,** his assistant; and **Louis J. Henke,** project engineer of Kenai.

Continued on page 113

CALENDAR

Jan. 22-23—Colorado Contractors Association, Inc., AGC., annual convention, at Shirley-Savoy Hotel, Denver.

Jan. 29—Central California Chapter, AGC., annual meeting at Hotel Mark Hopkins, San Francisco.

Jan. 31-Feb. 4—Associated Equipment Distributors, national convention, at Waldorf and Barclay hotels, New York City.

Feb. 1-3—Association of Asphalt Paving Technologists, annual meeting at Kentucky Hotel, Louisville, Ky.

Feb. 3-5—Institute of Transportation and Traffic Engineering, 6th annual California Street & Highway Conference, at the University of California at Los Angeles.

Feb. 9—Tacoma Chapter, AGC, annual meeting at Winthrop Hotel, Tacoma, Wash.

Feb. 11-12 — California Industrial Safety Conference, at Palace Hotel, San Francisco.

Feb. 17—Building Industry Conference, 3rd annual conference at the University of Colorado, Boulder.

Feb. 19-20—National Society of Professional Engineers, spring meeting, at Hilton Hotel, Albuquerque, N. Mex.

Feb. 22-25—American Concrete Institute, 50th annual convention, at Shirley-Savoy Hotel, Denver, Colo.

Feb. 25-27—American Concrete Pipe Association, 46th annual convention and meeting, at Fairmont Hotel, San Francisco.

March 1-4—Associated General Contractors, 35th annual convention at Statler Hotel, Los Angeles.

Apr. 28-May 1—Pacific Southwest Local Sections, ASCE, conference, at Sacramento, Calif.

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

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

Cotton M. Howard was recently appointed to a five-year term on the Washington State Board of Registration for Professional Engineers and Land Surveyors. He succeeds **H. C. Benson,** whose term expired.

* * *

William M. Jaekle has been appointed assistant chief engineer for the Southern Pacific Co., and **William J. Jones** has been named assistant engineer, maintenance of way and structures. Their promotions come as a result of the recent retirement of **C. J. Astrue,** former assistant chief engineer.

* * *

American Association of State Highway Officials elected **A. E. Johnson,** Arkansas, president, and **G. T. McCoy,** California, first vice president to serve in 1954. **M. U. Watrous,** Colorado, was named regional vice president for the Fourth Region. Outgoing president **R. H. Baldock** of Oregon automatically serves on the executive committee for the year.

* * *

At the Bureau of Reclamation office in Medford, Ore., it was announced that **William J. Attridge** has been transferred to a position as field engineer for the Minidoka Project in Idaho. Operations of the Medford office will henceforth be directed from Salem.

* * *

Mark Falk of Falk & Booth, San Francisco, is president of the Consulting Engineers Association of California and presided over the first annual meeting recently held in San Francisco. **Pecos H. Calahan** is executive secretary of the CEAC.

* * *

Following are the 1954 officers of Columbia Section, American Society of Civil Engineers: President, **Melvin B. Nelson,** Richland, Wash.; first vice president, **Myron H. Russ,** Richland; second vice president, **Glenn H. Von Gunten,** Walla Walla, Wash.; secretary-treasurer, **Albert E. Engler,** Richland. **Oliver A. Lewis** of Walla Walla will serve as director through 1956.

* * *

Paul T. Rowell was recently appointed executive secretary of the Upper Columbia River Basin Commission, with headquarters in Pendleton, Ore.

* * *

Paul J. Raver, Bonneville Power Administrator since 1939, accepted the position of superintendent of Seattle City Light following the retirement of **Eugene R. Hoffman,** effective January 1. In his past position as Bonneville Power Administrator Raver has had close association with the area's needs for development of low cost power. Hoffman was superintendent of Seattle City Light for

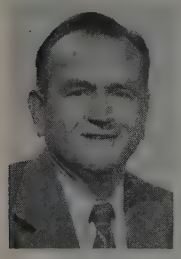
fourteen years, and at one time was employed by the Washington State Highway Department as an engineer. Hoffman will also be superseded by Raver on the Seattle Board of Public Works, on which he served as chairman. Another chairman is expected to be appointed in his place.

* * *

Jack E. Lloyd, project engineer, and for more than thirty years an employee of the Wyoming State Highway Department, retired from the state service at the end of the year.

* * *

Richard C. Crook, project engineer and assistant manager of the Zia Corporation at Los Alamos, New Mex., is the new president-elect of the New



Richard C. Crook, **president, New Mexico Section, ASCE**

Mexico Section of American Society of Civil Engineers. Also elected to serve in 1954 are: **Laurence E. Wheeler,** Santa Fe, first vice president; **Gordon E. Herkenhoff,** Santa Fe, second vice president, and **Rufus H. Carter, Jr.,** Albuquerque, secretary-treasurer. These, together with **J. L. Cheatham, Jr.,** Santa Fe, and **Rowland W. Fife,** Albuquerque, the two latest resident past presidents, make up the Board of Directors.

* * *

J. Howard Dunn is now associated with the Hersey Inspection Bureau of Oakland, Calif., in the capacity of chief engineer. Dunn was formerly associated with the City of Oakland as materials and research engineer.

* * *

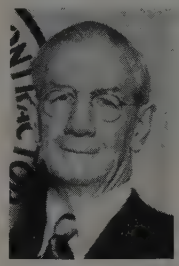
Joseph A. Bullen has been appointed to the Colorado State Highway Commission. He is an executive of the Fountain Sand & Gravel Co. of Pueblo.

* * *

L. Hilbert Young of the Oregon State Highway Department has been promoted to the position of assistant division engineer of Division III. He was previously district maintenance superintendent at Baker.

* * *

H. C. (Pat) Maginn, executive vice president of Calaveras Cement Co., has been elected president of Northern California Chapter of Associated General Contractors to serve in 1954. **E. L. Clements** of Clements & Co., Hayward, was elected vice president, and **Gordon Pollock** of George Pollock Co., Sacramento, treasurer. Newly elected to the board of directors are: **William Smith, Felix Siri, Edward Jones, Jack Burk, U. B. Lee, Gordon Ball, William Rapp, Ralph**



H. C. Maginn, **president, Northern California Chapter, AGC**

Brown, Charles Stewart, John Delphia and **Peter Schoening. Winfield H. Arata** is secretary-manager of the chapter.

* * *

Albert C. Spann, district engineer in Cheyenne, Wyo., for the Bureau of Public Roads was among those receiving merit awards at the recent convention of the American Association of Highway Officials.

* * *

At an organizational meeting held at China Lake, Calif., at which time the Desert Area Branch of the Los Angeles Section of the American So-

ciety of Civil Engineers was formed, the following men were elected to serve the newly formed branch: President, **Martin J. Snow,** U. S. Naval Ordnance Test Station, China Lake; vice president, **Wells O. Abbott,** Los Angeles Department of Water and Power, Independence; and secretary-treasurer, **Irwin I. Shull,** NOTS, China Lake.

DEATHS

Wright L. Felt, 55, formerly head of the Federal Works Agency in Nevada for many years, was recently struck by a streetcar in Los Angeles and killed.

Thomas A. Plunkett, 45, construction operating engineer, died at his home in Veradale, Wash., on Nov. 16.

Wash Robison, 64, building contractor, died in Venice, Calif., Nov. 9.

Harold S. Woodworth, 64, prominent contractor of Tacoma, Wash., died Nov. 2. He was a past president of Mountain Pacific Chapter, AGC.

Paul Wakefield, 49, a construction foreman for the Los Angeles Department of Water and Power, died Nov. 6.

John H. Wents, 74, head of a consulting geological engineering firm in Los Angeles, died Nov. 9.

Warren C. Earle, 72, former city engineer of Pasadena, Calif., died there Oct. 29.

True P. Wilson, an engineer for Morrison-Knudsen Co., Inc., was killed while working on a tunnel job in Sao Paulo, Brazil.

Thomas M. Davis, Sr., 71, retired district engineer for the Bureau of Public Roads at Portland, Ore., died recently.

Hugh L. P. Stewart, 60, former Bureau of Reclamation engineer, died in Idaho Springs, Colo., on Nov. 3.

Leroy Francis Harza, 71, died Nov. 22 in Chicago. He was internationally known as a consultant on dams and hydroelectric power plants. Much of the pioneering on The Dalles and Bonneville dams and power plants on the Columbia River was done under his guidance when he maintained his own consulting engineering office in Portland during the years 1912 to 1916.

Why Sellin Bros. are sold on **CAT*** performance

Harold and Roy Sellin, Hawley, Minn., are strong for the D8 Tractor and No. 80 Scraper. They say: "For success in earthmoving, buy Caterpillar!"

Building a mile of farm-to-market road near Hitterdal, Minnesota, Sellin Bros. made excellent time in spite of wet, boggy conditions. Their equipment on this job included four Caterpillar D8 Tractors and two No. 80 Scrapers.

The big units averaged 6 round trips per hour, carrying loads up to 22 cubic yards of heavy material, over a haul distance of 500 feet. Together the scrapers moved about 3,000 cubic yards in a 12-hour day. The earth handled was black loam and heavy, wet clay, and part of the haul was through standing water.

Here's what Harold and Roy Sellin say about their machines: "Caterpillar equipment is the best made, and durability is the outstanding feature. The No. 80 Scrapers load much faster and easier than other makes of machines, and production is higher."

When you're buying a scraper, look at your *last* cost *first*. Compare the Cat No. 80 or the new No. 90 with any other make on cost per yard. Then figure the cost of repairs and down time. You'll find Caterpillar Scrapers not only *outperform* but *outlast* other makes, in every kind of going.

Your Caterpillar Dealer will give you a demonstration right on your own job—*prove* that the big yellow rigs will produce more, in less time, at lower cost. Call him today!

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

CATERPILLAR*

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NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

SUPERVISING the jobs

C. L. Earsley, assisted by **Earl hannon,** is job superintendent for enry Thygesen & Co.'s $124,924 job f grading, draining and asphalt surcing of 4.8 mi. of highway in Albuuerque, New Mex.

* * *

Paul Cross is working for Henry hygesen & Co. as superintendent on .4 mi. of base course stabilization nd miscellaneous work in Bernalillo ounty, New Mex., contract for hich was awarded to Thygesen on bid of $131,792.

* * *

Jack Harbert, with the assistance foreman **Cecil Harbert,** is directg the 5.5-mi. grading and oiling ork in Lane County, Ore., recently warded to the Harbert contracting m at $106,174.

* * *

Jack Pound and **Don Hazen** head ie supervisory forces working on ie $1,000,000 power substation and ansmission line being installed by ontgomery Electric Co. near Klamh Falls, Ore. Another key man is **E. Stone,** operating manager.

* * *

Fred Michel is superintendent for nderson-Earley Co. on the joint m's contract in the amount of 98,749 for building Union Slough idge in Snohomish County, Wash. nother key man on the work is **urt Brewer.**

* * *

R. B. Crookston is job superintendnt for Wangsgaard Construction Co. a forest road job in Idaho being uilt at a cost of $263,630.

* * *

Project Manager **Bob Osborn,** perintendent **Milton Gracia,** master echanic **Bob Pate** and job engineer **ed Lowry** are among the top pernnel for Madonna Construction Co. a $695,878 contract for 7.3 mi. of ading and paving and two reinrced concrete bridges in San Luis bispo County, Calif.

* * *

Melvin E. (Mel) Evenson, supertendent, and **Karl K. Larson,** projt engineer, are with Morrisonnudsen Co., Inc., in Alaska where -K is building 39 underground mmunition storage igloos, seven storage pads and about 8,500 ft. of access road at Fort Richardson at a cost of $886,945.

* * *

Boyd L. Christensen, project manager, and **Harry C. Bullock,** project engineer, head the supervisory personnel on the recent $6,112,015 contract awarded to Morrison-Knudsen Co., Inc., and J. A. Terteling & Sons, Inc., for extension and strengthening of runways and airfield lighting and utility work at Mountain Home AFB in Idaho. Working as grade superintendent at the base is **Russell A. Healey. Evan L. Hendricks** heads the office.

* * *

Mike Rothwell is job superintendent on the $636,970 contract held by Peter Kiewit Sons' Co. for the erection of a 1,637-ft. reinforced concrete and steel deck truss bridge over the North Umpqua River in Oregon. **Woody Wilson** is job office manager.

* * *

Dave Sheehan, general superintendent, **Roy Hagerty,** his assistant, and project manager **Bob Wilson** head the personnel constructing parking area, streets, curbs, etc., at the Safeway distribution center, Denver, Colo. Foremen working at the site are: **"Chuck" Houcker,** forms; **Jack**

Are you qualified for membership in the "Turtle Club"?

MEMBERSHIP in the "Turtle Club" has been extended to several construction men in the West whose life or limb has been saved because of the effective use of a hard hat.

Lawrence M. Hill, of the Friedman Construction Co., working on a job at Eagle Mountain, Calif., on Sept. 4, 1953, was struck on the head and hands by a cable which came off the reel of a clamshell bucket. He received a slight head laceration and two broken fingers. His hard hat was crushed by the force of the blow, but it saved him from a serious and perhaps fatal accident.

E. E. Hastings, employed by the Custodis Co., a subcontractor for Kaiser Engineers, on Oct. 6, 1953, while working at ground level inside a smokestack, was hit by a rock which fell about 200 ft., striking his hard hat. It was lucky for him that he had it on, for that morning he had started out without it and returned for it. Because of this act, he was saved from injury.

Owen C. Thompson, a Bechtel Corp. employee, working on the Pacific Gas & Electric Co. steam plant under construction at Pittsburg, Calif., was 75 ft. below an overhead crane, when a worker on the crane accidentally dropped a spud wrench, striking Thompson on the head. Only his hard hat was injured as a result.

James Allen Hurt, employed by the U. S. Forest Service, was acting as watchman on July 22, 1953, in the Rogue River National Forest, Ore. A power saw operator was felling a tree which, while falling, struck the butt of a 1-in. pole. The pole struck Hurt on his hard hat, knocking him against a pile of rock. Though he received a head laceration, three fractured ribs and a small cut on his left arm, the attending physician reported that the hard hat in all likelihood was instrumental in saving his life.

If your life has been spared because you were wearing a hard hat and you can prove it, write for an application blank to Editor, *Western Construction,* 609 Mission St., San Francisco 5, or to E. D. Bullard Co., 275 Eighth St., San Francisco 3. On qualifying you will receive a certificate indicating the circumstances, and a lapel pin in the shape of a turtle will be mailed to you.

Myhoover, grade; **Reed Burton,** curb and paving; **Roy Rekansrud,** concrete; **Howard Herring,** deck, and **Glen Cram, Orlando Napue** and **Bill Schutten,** cement finisher. Office manager is **Vern Nelson.** This is a Peter Kiewit Sons' Co. subcontract just about completing.

* * *

Elmer Cross is job superintendent for MacDonald-Young & Nelson, Inc., on the erection of two bridges in Contra Costa County, Calif., a $294,-738 contract. Also on the job are **Bill Mueting,** carpenter foreman, and **Bob Russell,** timekeeper.

* * *

T. P. Drake, superintendent for P. S. Lord, Mechanical Contractors, is directing installation of connecting mains at The Dalles water reservoir in Oregon, contract for which was recently awarded to Lord on a bid of $122,960. **Thomas D. Telford** is engineer for the work.

* * *

Bill Brady, superintendent, with the assistance of steel foreman **Victor Franks** and carpenter foreman **Ralph Brady,** is supervising the erection of a bridge and approaches across the Kaweah River in Tulare County, Calif. This work is being done by W. F. Maxwell who got the contract on a bid of $142,521.

* * *

Keith Hardin heads the supervisory forces for the erection of the Wind River fishway in Washington being built by Cherf Bros. and Sandkay Construction Co. under a $234,540 contract.

* * *

G. W. Rich is Pacific Dredging Co.'s superintendent on a $129,560 contract recently awarded this company for dredging at Coos Bay and Isthmus slough in Oregon. Dredge captain is **Ralph Vea.**

* * *

Ora E. Elliott, Jr., superintendent, and **Eugene G. Alves,** project manager, are heading construction of 2.6 mi. of grading and surfacing on the Alhambra Ave. extension in Contra Costa County, Calif., a $308,357 contract held by Eugene G. Alves Construction Co. Master mechanic at the job site is **Lester L. Heath. Fred Carner** is resident engineer.

* * *

Forrest Risken is superintending the installation of powerhouse equipment at Chief Joseph Dam, Wash., for Gunther & Shirley Co. and E. V. Lane Corp. who recently received the contract on a bid of $3,419,355.

* * *

Ward White, job superintendent, and **James Zack,** project engineer, are heading the job of building Section 1, Unit A of the La Cienega and San Fernando Valley relief sewer being built in Los Angeles by Peter Kiewit Sons' Co. and Fred J. Early, Jr., Co., Inc., joint venture firm who recently received the award on a bid of $2,-082,965.

* * *

C. W. Holford is in the job superintendent spot for Henry Thygesen & Co. who is erecting the reinforced concrete Rio Puerco bridge on U. S. 66 in Bernalillo County, New Mex., a $159,444 job.

* * *

John Shumway, superintendent, is overseeing the construction of 3 reinforced concrete deck girder structures in Clackamas and Washington counties, Ore., contract for which was recently awarded United Builders, Inc., on a low bid of $176,366.

John Shumway

* * *

Charlie Luttrell is superintendent for Jack Adams' $205,198 contract in Los Alamos County, New Mex., where 4.7 mi. of grading, draining and asphalt surfacing is under way.

* * *

Cliff Taber is superintending a $545,563 contract held by J. E. Young Pipe Line Contractor, Inc., for earthwork and structures in connection with Goleta distribution system, part of the USBR Cachuma Project in California. **Bud Poulsen** is office manager.

* * *

Pete Balden, grading superintendent, **Arne Gulbranson,** gravel superintendent, and **Sid Thorson,** bituminous superintendent, comprise the supervisory force carrying out the Summit Construction Co. $659,499 contract of 10.2 mi. of grading and surfacing on the Sundance-Beulah road in Crook County, Wyo.

* * *

O'Neil H. Jones, job superintendent, with the assistance of grading superintendent **A. M. Stolzenburg** and surfacing superintendent **Carl Lowry,** is directing the work for Albert LaLonde Co. on this firm's $736,-589 contract to grade, gravel surface, oil and drain 4 mi. of highway in Cascade County, Mont.

* * *

Al Vercruysen, superintendent, and **Al Regalia,** project manager, are heading a road job in Fresno County, Calif., for Rice Bros., Inc., who got the contract on a bid of $195,104. Work consists of 5.3 mi. of grading and surfacing on FAS County Route 814.

* * *

John A. Messer, job superintendent, **H. A. Holland,** project manager, and **Jim McKee,** project engineer, head the work of constructing additions to the state mental hospital at Las Vegas, New Mex. Other key men on the project are: **Askel Salverson,** general labor and concrete foreman; **Roy Millsap,** equipment foreman; **T. P. Burbridge** and **A. B. Palmore,** carpenter foremen, and **J. P. Millaire,** steel foreman. **H. H. Aronson** is engineer, and office manager is **A. V. Vanlandingham.**

* * *

Martin Keeble is superintending the Laguna Creek highway work north of Davenport, Calif., involving the moving of 200,000 yd. of dirt for relocation of highway, contract for which is held by Edward Keeble Construction Co. On a subcontract for concrete structures, **Tony Caputo** is acting as superintendent for Dan Caputo, contractor.

* * *

Harney Harden is superintending a 5-mi. highway job on U. S. 60-70 in Yuma County, Ariz., for W. J. Henson who recently was awarded the contract at a cost of $286,723. **Charlie Joy** is general foreman for the work. **J. G. Cramer** is field office manager.

* * *

Cliff Casebolt, superintendent, assisted by **Glen Hayes** and **A. G. Clark** foremen, head a $139,653 storm sewer job extending for 5 mi. in Vancouver, Wash., for Milone & Tucci, Inc., contractor.

* * *

Leo G. Spinner, job superintendent, with the assistance of **"Toots" Powell,** key foreman, heads a $1,094,-357 contract held by J. A. Payton Co. for 3.9 mi. of grading and surfacing and 2 reinforced concrete bridges in San Diego Co., Calif. **Maurice Kennedy,** master mechanic, and **O. C. Sansone,** purchasing agent, are also working on this job.

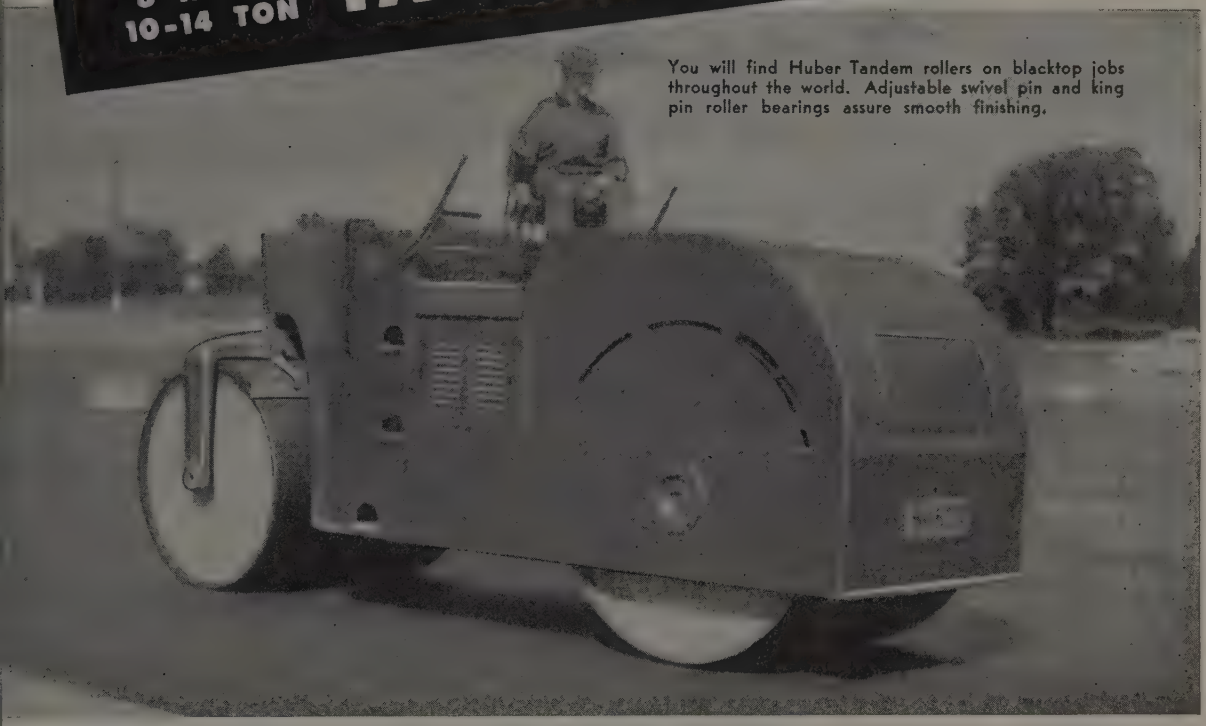
* * *

Homer Cheff as project manager and **Frank Cheff** as general superintendent are in charge of construction of the Chandler power and pumping plant and appurtenances at Prosser, Wash., for the A. J. Cheff Construction Co. Other key personnel on this $2,000,000 USBR job are: **Jack Greek**

HUBER

The *only* roller that can give "factory new" guide roll performance for the life of the machine . . .

8-12 TON
10-14 TON TANDEM ROLLERS



You will find Huber Tandem rollers on blacktop jobs throughout the world. Adjustable swivel pin and king pin roller bearings assure smooth finishing.

Adjustable tapered roller bearings for swivel pin, king pin and roll axle.

Only Huber Tandem Rollers can give you "factory new" guide roll performance for the life of the machine. The reason: only Huber has adjustable tapered roller bearings on both ends of the long swivel pin, as well as on the king pin and the roll axle.

Simple adjustments in the field keep the entire guide roll assembly "factory new" in performance. There is no looseness, no wobble to cause scuffing.

The full story of these and other features of the Huber 8-12 ton and 10-14 ton tandem rollers are described fully in Bulletin T-152. Write for a copy or see your nearest Huber representative.

THE HUBER MANUFACTURING COMPANY — MARION, OHIO, U. S. A.

Represented by

asey-Metcalf Machinery Co.	Los Angeles 22, Calif.
enkins & Albright	Reno, Nevada
ontractors' Equipment & Supply Co.	Albuquerque, New Mexico
eenaughty Machinery Co.	Portland 14, Oregon
eenaughty Machinery Co.	Spokane 2, Washington
eenaughty Machinery Co.	Seattle 4, Washington
Coast Equipment Co.	San Francisco 1, Calif.
Feenaughty Machinery Co.	Boise, Idaho
Foulger Equipment Co., Inc.	Salt Lake City 8, Utah
The Colorado Builders' Supply Co.	Denver 9, Colorado
The Colorado Builders' Supply Co.	Casper, Wyoming
Montana Powder & Equipment Co.	Helena, Billings, Montana
The O. S. Stapley Co.	Phoenix, Arizona

foreman; **Roscoe Fuqua,** master mechanic, and **Newton Tubbs,** carpenter foreman. Office manager is **Jim Davey. Jim Pendleton** is project engineer.

* * *

A. H. Hartman, a long-time construction superintendent around the San Francisco Bay area, is with the Nomellini Construction Co., in charge of all work for the company.

* * *

Merle H. Guise has recently returned to this country from South America where he spent some time on engineering jobs in various parts of Brazil. He is making San Francisco his headquarters.

* * *

Jess Black, superintendent, is working for J. E. Haddock, Ltd., on this contractor's $148,658 grading-paving job on Atlantic Blvd., Alhambra, Calif. **Jimmy Corralles** is general foreman.

* * *

Oscar Rayor, job superintendent, and **Paul Saylor,** construction superintendent, head the construction forces of S & Q Construction Co. and Rayor Construction Co. for the erection of a water treatment plant at Travis AFB, Calif. Contract recently went to this joint contracting team on a bid of $413,355.

C. T. Kirkland is job superintendent, **M. J. Ruddy, Jr.,** project manager, and **Fred H. Satter,** general superintendent, on a 3.9-mi. job of widening and resurfacing Sign Rt. 140 and two reinforced concrete bridges in Merced County, Calif. This is a $300,754 contract recently won by M. J. Ruddy & Son.

* * *

"Buck" Buchannan is job superintendent for M. F. Kemper Construction Co. on a contract amounting to $642,875 for circulating water piping and appurtenances at a steam plant located at Sun Valley, Calif. **Fred Swonson** is concrete superintendent and **Jess Castro** is pipe foreman.

* * *

Andrew (Ole) Ekre is job superintendent for Sather & Sons' contract for 4.6 mi. of approaches to the Columbia River bridge at Pasco, Wash. Other key men on this $580,856 job are **Jay Hensley** and **George Kinyon,** foremen; **George Stifter,** master mechanic, and **Gilbert (Dutch) Wagner,** carpenter foreman.

* * *

Garth W. Culp is superintending a highway job for Peter Kiewit Sons' Co., consisting of widening, gravel surfacing and road-mix oiling of a 8.5-mi. stretch between Poplar and Flaxville in Roosevelt County, Mont. Among the other key personnel on this $109,265 job are **Lee Witte,** foreman, and **Tommy Thomas,** office manager.

* * *

Emil Storm is job superintendent and **Bert Sandstrom** is general superintendent for Monson Bros., who recently received a contract at $576,695 to build Summit Reservoir for the City of San Francisco.

* * *

K. W. (Kenny) Sills is job superintendent for Ofcco Construction Co., Inc., on a $343,552 contract for earthwork, pipe lines and structures in connection with the Carpinteria Distribution System, a USBR project in California.

* * *

John A. Woodward, job superintendent, and **Art Harrington,** engineer, head the construction forces for W. E. Kier Construction Co.'s $593,200 contract to install the Randsburg Wash test range and rocket facilities at the NOTS, Inyokern, Calif.

* * *

B. A. Snow, assisted by **E. R. Rans,** is superintending the construction of a power plant in Denver, Colo., being built at a cost of $10,975,000 under contract held by Ebasco Services, Inc., for the Public Service Co. of Colorado. Serving in key positions at

he job site are: Supervisors—**B. W. Bates,** mechanical; **R. L. Wright,** boiler; **G. R. Fickel,** electrical. General foremen—**L. H. McFadden,** ironworker; **V. T. Bannister,** rod; **A. R. Collins,** carpenter; **F. H. Covey,** labor, and **Art McCullouch,** boilermaker. **W. J. Bond** is resident engineer, and chief inspector is **K. S. Stanton.**

* * *

Roger Wilson, grading superintendent, and **Keith Cunningham,** pipe foreman, are among the top personnel on the 10.1-mi. grading and bituminous surfacing job in Grant County, Wash., recently awarded to F. R. Hewett & Co. at $269,587.

* * *

E. C. Hill as job superintendent heads the $157,685 contract held by L. W. Vail Co. for construction of surfacing, parking areas, sidewalks, and sprinkling system at Camp Hanford, Wash.

* * *

D. J. Bandy is project manager on construction of training facilities at the Marine barracks, Camp Pendleton, Calif., a $1,625,575 contract being carried out by C. H. Leavell & Co.

* * *

O. K. Thompson is job superintendent on the construction work at Williams AFB, Ariz., where Rankin & Booth is building runway extensions and taxiways at a cost of $156,-330.

* * *

J. K. Gardner is general superintendent for contractor John H. Keller who has the contract for erection of a sewage disposal plant for the city of Englewood, Colo., a $525,000 job. Working as carpenter foreman at the site is **J. L. Ottaway. Dale Rea** is resident engineer.

* * *

Among the top field personnel constructing additions to Coor's Porcelain Plant in Golden, Colo., will be found **Ralph C. Besel,** field engineer, and foremen **Alvin Hahn** (carpenter), **Kenney Barnard** (steel), and **George Smith** (labor).

* * *

M. P. Gordon is general foreman for Northwestern Engineering Co., who has a contract from the state for modification of a viaduct located in Denver, Colo. Gordon is assisted by steel foreman **Paul K. Spoor,** carpenter foreman **Harold Griffin** and labor foreman **Gus Ruybal.** This is a $253,000 project.

* * *

Dan Handy, grade superintendent, and **G. J. (Mac) McGillvery,** concrete superintendent, head the construction of an overpass and underpass on South Colorado Blvd., Denver, Colo., contract for which was awarded to Lowdermilk Bros. on a bid of $442,-485. Assisting in the role of foremen

are **Sammy Samuelson,** grade; **C. H. Nichols,** carpenter, and **Tony Jensen,** labor.

* * *

Merle F. Moss is general superintendent for Gerald Phipps, Inc., contractor building the Belcaro shopping center in Denver, Colo., for Garrett & Bromfield. Job is expected to be finished the end of April.

* * *

Anther A. Hudgins is job superintendent on the erection of the National Farmers Union Life Insurance Co. office building going up in Denver, Colo., under contract held by R. T. Bickland Construction Co. Hudgins is being assisted by the following foremen: **Frank G. Kronquist** and **Dick Swartz,** carpenter; **Henry Ruff** and **Felix Trujillo,** labor; and **Ernest Little** and **Leo Lavalle,** ironworker.

* * *

Frank Bueltel, superintendent, and **R. T. Clemmons,** project manager, are at the head of construction forces building the $1,000,000 men's dormitory at Colorado College, Colorado Springs, Colo., contract for which is being carried out by M. W. Watson. **Clarence Hayes** is carpenter foreman and **Walter Dunster,** labor foreman. Handling the excavation and grading is **Joe Gleeson.** Among the subcontractors are: Masonry, Kenneth Neeley; foreman **Everett Bishop.** Sheet metal, Heyse Sheet Metal Co., foreman **Harold Thurston.** Structural and reinforcing steel, Casey Welding Co., superintendent **Frank Ladwig.** Plumbing and heating, Benbow Plumbing & Heating Co., heating foreman **Carl E. Webb;** plumbing superintendent **Lyle Cobb,** and steamfitter foreman **J. W. Amerman.**

* * *

Elmer Tanner, superintendent, assisted by carpenter foremen **Bryce Cool,** is in charge of construction of the East Junior High School in Colorado Springs, Colo. Contract was awarded by School District II to Walter Nashert Co., and will cost over $1,000,000. Subcontract for reinforcing is in the hands of Pikes Peak Steel Co., with **O. W. Noble** filling the foreman spot. **Arthur Sidle** is foreman for Economy Forms, who has contract for the form work.

* * *

Charles Mason, superintendent, and **Rudy Gasten,** project manager, with the assistance of **Steve Sperlack** and **George Keller,** are heading the construction of a large housing project being built in Thornton, Colo., for Hoffman Homes, Inc., Phoenix, Ariz. F. & S. Construction Co., Inc., is the contractor. Among the superintendents working on the project are: **Alvin Davis,** concrete; **John Baugh,** brick; **Ed L. Degan,** equipment, and **James Mills,** mill superintendent. Carpenter foremen are **Charles Cox, William Eckman, Beryle Harrer, Harry O. Adamson, L. D. Cook, Wayne Johnson, Paul Koch, Ralph Mickle, Arnold Mosbek, Ray Owen, Melvin Plambeck, Martin Quimby, Victor Saucerman, John Warner, Charles Wilson** and **Andrew Winholz. John B. Cassidy** is job engineer, **Joe Tinianow,** office manager, and **S. F. Dakolios** handles the payroll. Utilities are subcontracted to Birchby and Nauman, Inc., with **A. V. Williams** serving as job superintendent. **Morse Bertron** is general foreman and **Ivan Clair,** sewer foreman.

* * *

Henry E. Sexton, general superintendent, with the help of assistant superintendent **George D. McFadden,** is in charge of construction of a 23-story office building being erected in Denver by George A. Fuller Co. and Webb & Knapp, Inc. Other key personnel for the contractor are **William N. Hurst,** mechanic supervisor; **Frank Vallo,** general carpenter foreman, and **John G. Layter,** job runner. Office manager is **Louis Winkler. George McFadden** is chief engineer. Representing the architect and owner is **Eason Leonard.** R. W.

Mier Construction Co. has the subcontract for foundations and walls, and in this work Vallo has the assistance of **Emry Schmitz,** foreman.

* * *

Don McGuire is job superintendent for C. L. Hubner Co., who recently was awarded a contract at $123,799 for 2.2 mi. of grading, surfacing and road-mix oil treatment on the Bosler-Laramie road in Wyoming. **John Young** is assistant manager for the contractor.

* * *

Barney Hedberg, project manager, **Bill Myer,** field superintendent, and **Bernie Carroll,** engineer, make up the top personnel on the $1,407,980 job recently awarded Stolte, Inc., to construct the Contra Costa County court house located in Richmond, Calif.

* * *

James A. Kilgroe is acting as superintendent at the site of bridge and viaduct work over the D&RGRR tracks at Fourth Ave. in Pueblo, Colo., contract for which was awarded the contracting firm of L. H. Kilgroe at about $25,000.

* * *

Bill Cole, superintendent, heads the construction of 5.4 mi. of grading and paving on the Oregon Coast Highway for Peter Kiewit Sons' Co., who won the contract on a bid of $862,226. Office manager is **Harry Eckstein.**

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:

Albert M. Croxson, 35, and Donald V. Hogan, 35, steelworkers, fell 232 ft. to their deaths from the Golden Gate Bridge into San Francisco Bay November 6. They were working for Judson Pacific-Murphy Corp. on a $3,065,000 contract to install lateral bracing under the bridge's roadway. The accident happened when one of the movable scaffolds, on which the men were working, came loose from its moorings and fell from its support beam.

An unshored trench claimed two more lives in Portland, Oregon, on November 20 (*Western Construction* —September 1953, p. 59 "Death in the trenches"). Leonard W. Denniston, 37, was killed when 15 ft. of sand buried him in a sewer trench. Wilburn Byers, sewer department foreman, led a rescue party. When Denniston's body was uncovered, about 4 hr. later, a second cave-in trapped and killed Byers. A recent issue of *Life* magazine showed pictures of the second slide.

Clifford Home, 47, was killed November 23 when he fell 15 ft. from a scaffold at Chief Joseph Dam. He was working for Bigge Crane and Rigging Co., a subcontractor on powerhouse construction.

George R. Anderson, 36, was killed by a falling tree October 30 in Yellowstone National Park, Wyoming. He was working on a tree removal crew for Peter Kiewit Sons' Co., clearing the way for a new park road.

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

Milan Gray, 62, a King County (Washington) road maintenance employee was injured fatally when a dump truck ran over him just after it had dumped a load of gravel. He was dead on arrival at the hospital.

Robert Jones, 31, was crushed to death on October 28 when caught between a dump truck frame and bed near Ft. Morgan, Colorado. Investigating officials said the truck had failed to dump and Jones was trapped when he leaned under the up-ended truck bed to see what the matter was.

Homer Hobson, 45, a plumber, was crushed to death November 5 in San Andreas, California, when a large boulder toppled into the trench where he was working. He was employed by a plumbing contracting firm.

Michael (Dutch) Kenneely, linesman for the Bureau of Reclamation on a job near Lusk, Wyoming, suffered severe burns on November 27 when he was jolted by 14,000 volts from a short-circuited electric line. His life probably was saved by his use of a hot stick, a safety device used by workers on high voltage lines.

Handbook tells about setting up safety program

Detailed information on how to set up and maintain a safety program for your organization is contained in the National Safety Council's new "Handbook of Accident Prevention for Business and Industry." The 94-page illustrated handbook covers such subjects as plant layouts, materials handling, housekeeping, machine guarding, electrical hazards, pressure vessel hazards, first aid, fire prevention and personal protective equipment. It advises the small business man who cannot afford to employ a full-time safety specialist how to make use of outside assistance. Service and insurance organizations, governmental agencies, trade associations and professional societies which can help the small operator are described. For further information and prices, write the National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

Insurance executive gives safety policy pointers

The contractor, not the insurance company, is to blame for the fact that many contractors are not getting their money's worth from their compensation insurance carriers, according to S. F. Staples, vice president in charge of sales and advertising for Employers Mutuals of Wausau, Wausau, Wisc. In an address to the construction section of the National Safety Congress in Chicago, Staples said, "The insurance representative is all too often left completely or partially out of the contractor's operations and planning ... (so) that sometimes it is virtually impossible for (him) to get a close-up picture of the risk he is asked to protect." Knowledge of the contractor's operations is essential to the insurance representative if he is to render top efficiency to enable the contractor to get full benefit from his premium payments.

He emphasized that workmen's compensation insurance should be considered as a controlled rather than a fixed item of expense. Premium payments, he said, are based on accident experience with a reduction in the ratio of accidents inevitably leading to a reduction in premium payments. He then outlined four qualifications that a contractor should expect from his insurance carrier:

(1) Financial strength.

(2) Know-how in the contractural field.

(3) Services other than accident prevention, such as claims, underwriting and audit.

(4) Accident prevention and job training services.

Staples insisted that a contractor should give particular attention to the safety services offered by compensation writing carriers. Many carriers offer a high-quality safety program; these are the only ones to be considered when placing compensation business.

As a step towards making workmen safety conscious, Staples suggested the following four-point program:

(1) Inform men in detail about what they are going to construct.

(2) Give detailed instructions about how the foreman wants the work to be done and have the foreman show the men how to do it, emphasizing and outlining safe work methods.

(3) Safe working conditions must be explained and maintained.

(4) Safe tools and equipment must be used.

TRICKS of the TRADES

On-the-job steam cleaning cuts downtime and repairs

CONTRACTORS in the past generally have regarded steam cleaning as a job to be done at headquarters shops prior to annual or periodic overhauls. Now a growing number of contractors find regular steam cleaning right on the job makes important savings (a) by uncovering worn or faulty parts before costly breakdowns occur, and (b) by blasting away corrosive or abrasive dirt and grease so parts actually last longer.

As an example, a Northwestern mine operator found ore dust, mud, and grease practically grinding track rollers off his crawler tractors. A high-pressure Malsbary steam cleaner made it practical to steam clean crawler tractors after every 24 hr. of service just before greasing. Reports the maintenance supervisor, "Where we were getting only about 1,200 hr. on a set of rollers, we are now getting 2,400 hr. or more."

In the case of a Canadian contractor, steam cleaning reduced downtime in freezing weather. When scrapers stood overnight without cleaning, mud froze in the scraper bowls and caused cable breakage the following morning. Two Malsbary steam cleaners enabled this contractor to remove mud each night from 10 Caterpillar tractor-scrapers and 25 LaPlant-Choate motor scrapers.

Conyes Construction Corp., pipelaying contractor of San Pablo, California, found a high-pressure steam cleaner so successful in cleaning heavy equipment on location on a Midwestern pipeline job, that the cleaner is being mounted so it can shuttle between field maintenance sites. Even on equipment that hadn't been thoroughly cleaned in over a year, Conyes' operators report the following cleaning times:

Caterpillar D8 with sideboom, about 2 hr.

Large Cleveland trencher, 4 to 5 hr.

1½-yd. Lima shovel, 3 to 4 hr.

In addition to savings in downtime and lowered repair costs, highway departments report better care by operators. C. J. Chaffins, county road engineer of Spokane County, Washington, places considerable emphasis on periodic steam cleaning and painting. He feels that it not only preserves equipment, but also operators take greater pride in the care of machines that are cleaned and painted at regular intervals. Furthermore, clean equipment impresses the public.

Complete records aren't available, but Malsbary Manufacturing Co. reports that at least 27 county and state highway bodies in the West regularly use its steam cleaners.

What size steam cleaner should you use? Here's the answer, according to Malsbary:

"Steam cleaners are divided into two general types: steam vapor cleaners, which depend on steam for their working pressures and have a practical operating limit of 75 to 100 psi.; and heavy-duty, high-pressure steam cleaners, which depend on pumps for working pressures and are capable of delivering hot solutions at 400 lb. pressure.

"Malsbary uses this rule of thumb when making recommendations: Clean with heavy-duty steam cleaners if you have: (a) many tracklayers; (b) lots of heavy cleaning, that is, tars, thick mud or greasy dirt; (c) work requiring one man all day long.

"Clean with steam vapor models where: (a) you clean only intermittently and then for only 2 or 3 hr.; (b) you have only 2 or 3 hr. of cleaning every day."

While each operator has his own favorite methods, the following can be used as a guide for heavy-duty cleaning:

For quickly removing stubborn deposits of grease, road oils and tar, use high-pressure steam cleaning, 150-200 lb. pressure and up to 325 deg. F. coil temperature.

For removing common dirt, mud and clay, use high-pressure cold water to 400 lb. and 5 to 15 gpm.

Where dirt and mud are impregnated with oil and grease or where there are light deposits of grease and oil; also for quick de-icing, use high-pressure hot water to 400 lb. and 5 to 10 gpm.

For hand washing trucks and equipment, use low pressure warm water, 3 to 15 gpm. at 120-200 deg. F.

For de-gassing tanks; heating asphalt tanks, cleaning asphalt tanks; for sterilizing purposes, use straight steam, 15 to 30 boiler-hp.

MODERN MACHINERY Co. of Seattle uses a Malsbary Model 250 steam cleaner to clean a Link-Belt shovel. It took 4 hr. to steam off the heavy grease, hardened clay, dirt, and gravel.

Announcing
Major Advance in
Tractor Design!

New Caterpillar oil-type flywheel clutch

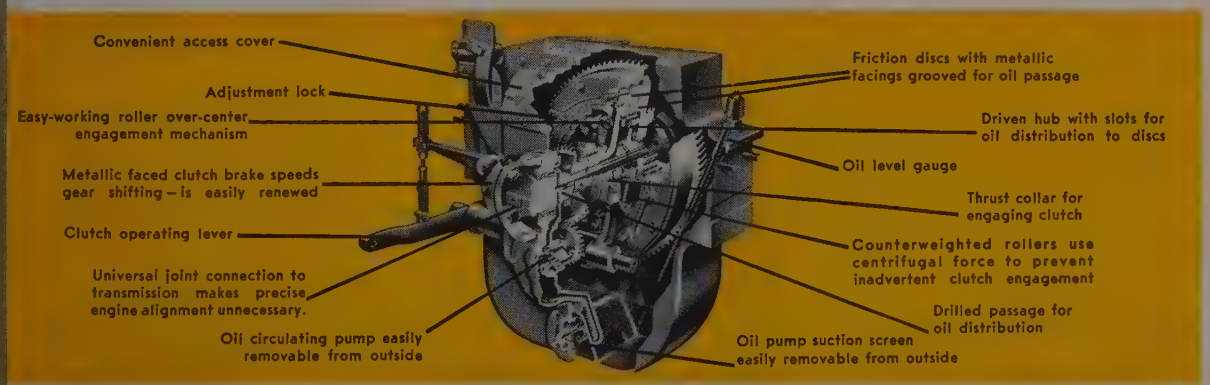
now standard in the D8, D7 and D6!

nce again Caterpillar leads the field in an advance that oosts production, cuts down time and lowers operating sts. The new oil-type flywheel clutch, now standard in e Cat* D8, D7 and D6 Tractors, means a new high in oney-making performance for you from these three gged machines. Exhaustive on-the-job tests prove that is clutch lasts many times longer than other clutches under *entical* conditions. They also prove it enables you to run ese tractors two to four times longer before making clutch djustments.

Here's how it works. The oil system is entirely separate om that of the engine. While the engine is running, the l pressure flows to all working parts of the clutch. Oil fed constantly through the radial and circumferential grooves in the friction discs even when the clutch is engaged, thus cooling the friction discs and pressure plates at all times. As a result, there's minimum opportunity for wear and heating to take place. That's why adjustments are very seldom needed and disc replacement normally required no more often than engine overhauls. For easy access, the clutch has a dirt-proof housing with a big opening at the top—a mechanic doesn't have to disturb engine or transmission to get at it.

Get the whole picture from your Caterpillar Dealer. Remember, he backs all sturdy yellow equipment with genuine parts service—there's never an "orphan" in the Caterpillar line. Ask him to demonstrate on the job!

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



New Caterpillar oil-type flywheel clutch gives you greater dependability and lower service and maintenance costs than any other clutch under identical conditions, normal or tough.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

TOOLS of the TRADES

Clip the coupon on page 133 for more information on any of these items

A18

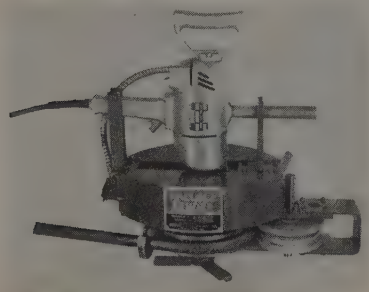
SELECTING CRANE-EXCAVATORS—A pocket-sized booklet called "Handbook of Data for Proper Selection of Crane-Excavators" has been put out by the **Wayne Crane Division, American Steel Dredge Co., Inc.** It contains check lists of all the factors you need to consider when selecting a crane-excavator that is best suited for your particular job. For a free copy, fill in the coupon with the key number of this item.

A19

SPOT WELDER—Ampower Products Co. features an electronic timing control on its new portable spot welder. The welder, which has a pistol grip for easy operation and handling, has an output of more than 10 kva. It weighs 26 lb. Further information can be had by filling out the coupon. Literature is also available.

A20

A NEW BENDING machine, the Wallace No. 600, has been placed on the market by the **Wallace Supplies Mfg. Co.** This portable machine will bend from ½- to 1¼-in. IPS pipe to any



angle from 0 to 180 deg. It operates on 115-volt, single-phase, 60-cycle AC or DC, and one man can average 60 bends per hr. with this machine. Fill out the coupon for more information.

A21

HYDRAULIC CONTROLS available for the operation of scrapers, shovels, loaders, and tool bar arrangements are discussed in Form 30794, an 8-page booklet complete with cutaways and photographs, published by the **Caterpillar Tractor Co.** Send in the coupon for your free copy.

A22

TRUCK HOIST—Norweld, Inc., is introducing a 3-way hydraulic truck hoist designed for all-purpose use up to 10-ton capacity. Pivot hinges enable any 1½- or 2-ton truck to be converted into a dump truck that will dump on right or left sides or off the end. The bed can also be locked for rough hauling of shifting loads. Fill in the coupon for more information.

A23

CABLE REEL—Wastage of wire rope due to the wearing out of small sections on tractors can be eliminated by use of a new cable reel called the Tournarope Bantam Reel, according to its manufacturer, the **LeTourneau-Westinghouse Co.** The reel is 14 in. in diameter and holds 150 ft. of ½-in. Tournarope. It is equipped with a bracket that can be welded or bolted on a tractor.

A24

A NEW TECHNIQUE for automatic hardsurfacing in which the alloy content of the deposited metal is supplied by an agglomerated granular flux rather than by the electrode has been developed by the **Lincoln Electric Co.** This makes it possible to apply automatic hardsurfacing with conventional mild steel electrode by substituting the new hardsurfacing flux for the mild steel flux normally used. Two hardsurfacing fluxes are available, Flux H-545 and Flux H-550.

A25

GREASE FITTINGS can be protected from dirt and other abrasives by use of the Zur-Kap, according to its manufacturer, **Winner Mfg. Co.** Zur-Kap, made of oil-resistant neoprene, snaps on and off easily and was designed to eliminate danger of excessive wear from dirt particles.

A26

LOCKING WRENCH—The **Utica Drop Forge & Tool Corp.** has announced its Utica No. 92 locking wrench. The main improvement it represents over a standard wrench is a lever, about 3 in. long, which snaps over the handle. This lever operates on the knurl to control the jaw locking and unlocking action. The new wrench is available in 8, 10, or 12-in. sizes. Fill in the coupon for further information.

A27

SPARK PLUG electrodes can be set accurately by use of a special plier announced by the **Owatonna Tool Co.** Sizes on the gauge wheel range from .022 to .040, which cover manufacturers' specifications on all makes of spark plugs. The gauge wheel is easily and quickly set to the desired size. Once the gap is established, the electrode will not spring back.

A28

FUME REMOVER—**Oxy-Catalyst, Inc.,** has announced a device for removing carbon monoxide, fumes, and odors from all types of gasoline-powered equipment. Called the OCM Catalytic Exhaust, this device is reported to permit safe indoor operation of gasoline engines in such places as mines and tunnels. It is described in a four-page folder available free by filling in the coupon.

A29

GREASING UNIT—A new battery-powered greasing unit, the Greasemaster Senior, which pumps grease directly from the drum is being offered by **G & T Industries.** A hydraulic ram pump forces grease through a hose to a handle where pressure can be varied from 600 to 12,000 psi. The unit, which weighs 40 lb., is available in two models. Model A-100 fits a drum of 14¾ in. maximum outside diameter and a minimum depth of 22 in. Model A-110 fits drums of the same diameter but of at least 26 in. in depth.

Extra Gradall wheel compacts close corners

GRADALLS are getting to be like bulldozers. Every month someone comes up with a new application of a new front-end attachment. This time the trick is a rubber-tired roller and the people responsible are Tyrrell & Davis Co., contractors in Pasadena, Calif.

The firm has a contract for a variety of earthwork—grading, excavating, trenching, compacting—the new Valley Steam Plant, a $10,000,000 installation under construction in San Fernando Valley for the Los Angeles Department of Water & Power. Compaction was the necessity that mothered invention, when Tyrrell & Davis had trouble getting into the corners of six 171,000-bbl. fuel oil tanks.

Robert McKession, an engineering consultant, took the problem and his solution is pictured here. He designed a 2,700-lb. rubber-tired wheel, to be

mounted at the end of the Gradall boom. Hydraulic controls in the operator's cab, controlling the Gradall's telescoping and wrist actions and boom swing, made wheel movement a simple and positively controlled thing. Tyrrell & Davis used the rig to compact tank slopes and corners. Here was a case where getting into a corner also meant getting out of one!

Drilling by teamwork

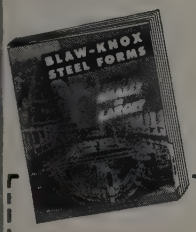
HERE is a trick in line drilling. It is a method of attack developed by K. O. Duncan, manufacturer of the Duncan Roc-Jak, to minimize overbreak and provide sheer sides in the excavation.

Assume the line holes to be 12 ft deep and that the specs call for three holes per lineal foot, collared with a 1⅝-in. bit. A 3-man crew, each with a jackhammer, goes at it this way.

One man starts right in drilling

Blaw-Knox Steel Forms and Gantry used for building 29 ft., 6 in. high retaining wall on the Pennsylvania-Lincoln Parkway, Pittsburgh, Pa.

Consult BLAW-KNOX ENGINEERS for the low-cost answer



WRITE FOR BULLETIN 2035

Get complete details about Blaw-Knox Steel Forms and the consultation service that is available to any contractor without obligation.

TAKE advantage of the Blaw-Knox consultation service *before* your plans are drawn or blueprints made—solve your concreting problems before you have them.

Blaw-Knox has the skill and experience of more than 40 years of building Steel Forms for big construction projects. An unusual concreting problem to you may already have been solved by Blaw-Knox engineers who are trained to get to the core of a problem and find a simple, less costly method of solving it. They will recommend the Blaw-Knox Steel Forms designed to fit your job and suggest simplified operating procedures to save you time and money.

Before you start to plan your next job, write, wire or phone for information. Call on the Blaw-Knox consultation service in the *preliminary planning* stage.

STEEL FORMS

BLAW-KNOX

BLAW-KNOX COMPANY
BLAW-KNOX EQUIPMENT DIVISION
Farmers Bank Building
PITTSBURGH 22, PA.
Offices in Principal Cities

BLAW-KNOX

while the other two go ahead with shovels to clear the line and spot the holes. The first driller is supplied with a 2-ft. and a 4-ft. drill rod and a tungsten carbide bit. He drills only 4 ft., then moves on to start the next hole. The other two men then follow up, one man using 6- and 8-ft. rods, the other drilling to final depth with 10- and 12-ft. rods.

In this manner the job is done with just one set of steel and bits, whereas three sets would be needed if each driller collared and bottomed the same hole. Also, downtime is less, since each driller has only two rods to drag along.

Says Duncan, "This arrangement may be 'old shoe' to operators now. I first thought of the idea on cellar excavation for the Empire State building, which was line drilled on all four sides at the property line. Detachable bits weren't available then, and one steel nipper serviced the 3-man crew with forged bit steel."

Portable lube plants bring service to the work site

LAST JUNE *Western Construction* published an article on lubrication practices used by Peter Kiewit Sons' Co. on a freeway job near Antioch, Calif. A lot of interest was generated by the portable lubrication plant used on the work and pictured with the article. Such plants have been more or less elaborately put together in the past, but this one was a commercially manufactured unit. To get a better picture of portable lubrication plants and their applicability in today's mechanized construction scene, the editors checked with Lincoln Engineering Co. of California. Here is what L. L. Meikle, president of the company, has to say:

Proper lubrication

"The greatest single factor in a successful preventive maintenance program is proper lubrication. To have proper lubrication, we have two primary factors—a lubricant and a method of applying it. To get the lubricant where it will do the most good at the right time requires properly engineered portable lubrication plants, indvidually designed to meet the contractor's requirements.

"The master mechanic and shop superintendent responsible for their preventive maintenance programs should solicit the help of oil company specialists for proper lubricants, and the lubrication equipment manufacturers for help in designing lubrication plants to meet their needs. Many earthmoving contractors and operators of heavy-duty equipment recognize the importance of preventive maintenance programs, and have called on us to assist them.

"These lube units may cost anywhere from $1,000 to $8,000, depending on type and size.

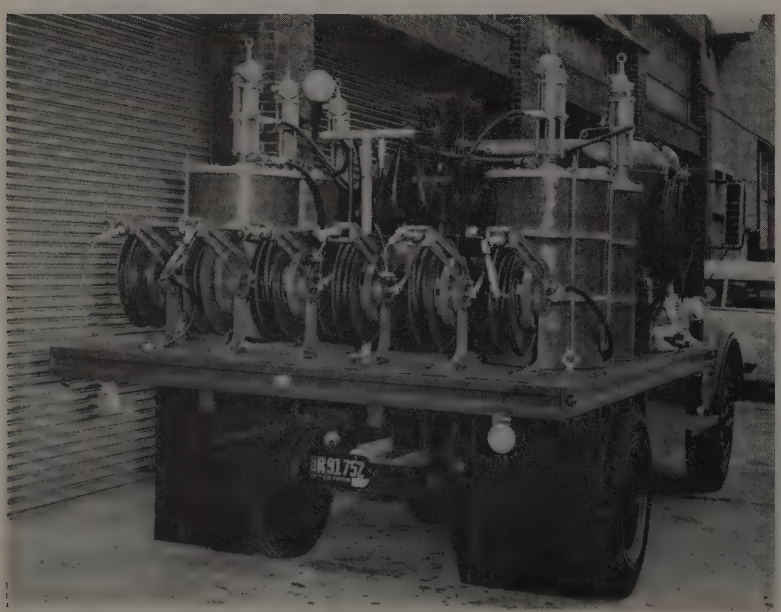
Retracting reels

"Usually, the plant is engineered to dispense track roll, gear oil, motor oil, and chassis lubricants direct from the original 400-lb. containers. Reels automatically retract the long hoses used in reaching all points of lubrication in large equipment. The pumps, which are actually the heart of the unit, are operated by air, this air being supplied by a gasoline-driven air compressor. Some portable lubrication plants are equipped with diesel tanks, gasoline tanks, water tanks, and a great number of them are complete with gasoline-driven light plants for night lubrication. It depends on the shift schedule and amount of equipment being serviced.

Minimum of downtime

"A portable service station is efficient. It takes preventive maintenance to your equipment and does not require you to move any heavy, costly units to a central point for service. You get proper lubrication at frequent intervals, resulting in a minimum of downtime."

THIS CS-5 LUBROVAN is owned and operated by the Southern California Edison Co. Its equipment was furnished by the Lincoln Engineering Co. of California.



Safety first is now the word for Moto-Bug

NEW safety and performance features now are incorporated in every Moto-Bug, reports Kwik-Mix Co. The Moto-Bug is Kwik-Mix's power wheelbarrow which can be easily converted to flat bed truck or fork lift.

First on the list of safety features is a "dead man" internal expanding brake system which instantly stops all machine movement when the operator's foot is off the treadle.

Inspection of the V-belt and other engine parts has been simplified by building a good-sized inspection door into the front panel of the cowl. Rear of engine is open so the power plant can be inspected from both sides.

Another new feature is a vertical clutch control lever with neutral, forward, and reverse positions. It is easily at hand for the operator and readily controls forward and reverse motion.

Also more convenient to the operator and lessening work fatigue is the new height of the Moto-Bug steering wheel. It is now 3 ft. 6 in. above the riding platform on all current models.

On all models with hopper and flatbed platforms, a single cast body latch hook is now a standard feature. An adjusting spring can be preset for maximum wearing life. It replaces a two-hook latch used previously.

For greater stability, the double wheels which are standard on the drive axle of the fork lift version are now cast in one piece. Tires for these double wheels are separate for easy inspection and changing when necessary.

For more detailed information on Moto-Bugs, write to Kwik-Mix Company Sales Office, 3029 W. Concordia Avenue, Milwaukee 16, Wisconsin.

WELDING SET-UP features two tricks to assure down-hand welding at all times. Discs and rollers shown rotate piles in place. For some work, discs roll along webs of steel on ground.

Fabricator weld-splices piling for Richmond-San Rafael Bridge

AT THE SITE of the wartime shipyard of Moore Dry Dock Co. in Oakland, California, Gilmore Fabricators, Inc., subcontractors on the new $62,000,000 Richmond-San Rafael Bay Bridge across San Francisco Bay, is splicing together steel piles totaling 557,000 lin. ft. These 14-in. 89-lb. H-beams make up 5,063 driven piles running to lengths of some 200 ft.

Gilmore set up shop for assembly-line splicing of the pile lengths ordered by Ben C. Gerwick, Inc. and Peter Kiewit Sons' Co., joint venture contractors for the bridge substructure. Two welding positioners were made consisting of pairs of large steel discs which clamped over the H-beams and, in turn, revolved on rollers set on the ground. As the job progressed, it was found that the channel of an H-beam itself would make a satisfactory "track" for the rolling positioners.

To accomplish the bond between shorter piles, the sections are placed in the jig, ends trimmed and cleaned off by a portable grinder, butted closely together and tacked by means of short splice plates joined with a conventional arc welder. Care here is essential, however, since alignment tolerances demand nothing in excess of ⅛ in. per 10 ft. of sweep.

Next, by use of either a Lincoln or Linde Unionmelt semi-automatic "squirt" (shielded arc welder) the operator joins the 15.4 ft. of splice plate and butt seams. Each welder handles two piles.

On completion of the splice, the positioning discs are parted and a revolving crane swings the pile out onto rail-mounted dollies for transportation to barges.

NEW LITERATURE

More information on any of the items in this section may be obtained by using coupon on page 133.

101

Getting rid of glare

How Horn AE Dispersed Black gets rid of the glare on concrete highways without neutralizing or counteracting the air-entrainment is the subject of this 6-page folder by **A. C. Horn Co., Inc.** Provides detailed test data, uses and recommendations required under varying conditions. Photographs show varied applications. This product is a scientifically formulated carbon black dispersion that has a uniform colloidal dispersion and stable tinctorial strength.

102

Electricity on rails

D. W. Onan & Sons, Inc., has a new 4-page folder describing their air-cooled electric generating plants and their use by railroads. Illustrations show job applications of both gasoline and diesel driven units. General specs are included.

103

Having trouble making ends meet?

All you need to know about fast hookups with no loose parts is covered in a 2-color, 4-page bulletin by **Victaulic Company of America,** manufacturer of pipe couplings and fittings. Six photographs show you, step-by-step, how the newly developed Snap-Joint works in just a matter of seconds. Other pictures illustrate examples of the wide adaptability for this new product.

104

For safe welding

Metal & Thermit Corp. has a 4-page color catalog on its line of fiberglas welding helmets and handshields. Special attention is given to "Fresh-air" (a patented Plenum air system) for keeping "cool heads in hot spots." Put key number on coupon and mail in for a copy of this brochure.

105

Tells about tees and clamps

Smith-Blair, Inc., manufacturer of waterworks supplies and specialties, is offering two new brochures. One (4 pages) gives photographs, drawings, specifications and price lists for its plain-end cast-iron tees for cement-asbestos and cast-iron pipe, and the other (8 pages) covers its taper seal ductile iron service clamps. Send in for free copies by putting key number on coupon.

106

270 pages on steel products

All you need to know about the wide variety of steel products and other industrial supplies manufactured by **Kyle & Co.** is contained in this new 270-page catalog. Includes indexed sections on reinforcing bars and shapes, sheets and plates, steel sash, fences, posts, wire products, welding and cutting supplies, pneumatic and electric tools, and other products of interest to contractors.

107

Folder on wire rope slings

"New Ideas in Red-Strand Slings" is a new folder offered by **Leschen Wire Rope Division, H. K. Porter Co., Inc.** Fully describes this new line of multiple part and single part slings and the Pin-Lock thimbles, explaining how these thimbles reduce sling costs by an average of 20%. Also describes Red-Strand Grommet slings.

108

Materials handling machines

Sauerman Bros., Inc., has a 4-page brochure on its long-range materials handling machines. Line drawings explain operation of the drag scraper, slackline cableway and tautline cableway, and there are sections on scrapers for storage, for excavating, and for boom machines.

109

Brochure on Transite ducts

Johns-Manville has issued a 12-page brochure covering installation and maintenance information on Transite Conduit (for exposed work and installation underground without concrete encasement) and Transite Korduct (for installation in concrete). Fully illustrated, the brochure cites many typical examples from public utilities and other industries which show how use of Transite duct materials can cut cable subway costs. EL-29A.

110

On Pioneer gravel plants

Pioneer Engineering Works, Inc., is offering a series of individual bulletins describing and listing the specifications on its new line of 7 Bottom Deck Feed plants, with crusher sizes ranging from 24 x 16 to 40 x 22, for gravel aggregates production. Plant set-ups are shown with color diagrams tracing the flow of material through the plants. Points out how Bottom Deck Feed, a patented principle of aggregates production, can be utilized to obtain maximum efficiency from all units in the plant. Put key number on coupon and mail in for a free copy.

111

Sanitary landfills

This 16-page booklet answers the vital questions concerning the problems of sanitary refuse disposal. Form 30852 by **Caterpillar Tractor Co.**

112

About Hall-Scott engine

This is an 8-page brochure introducing you to the powerful Hall-Scott Model 2269-0 engine with 350 available horsepower. You'll find out about its many outstanding features which are highlighted in a two-page cutaway photograph. General specifications are included, along with power curve charts for natural gas, LP gas or gasoline, and a full page installation drawing. This heavy-duty engine is recommended for drilling and pumping. Published by **Hall-Scott Division, ACF-Brill Motors Co.**

113

Cat D6 tractor

Packed with facts describes a new bulletin released by **Caterpillar Tractor Co.** on its diesel D6 track-type tractor. This 32-page literature describes what goes into making up each component of the D6 by use of

hotos and model cutaways of each omponent. Highlight is a double-age detailed cutaway of the D6 itself. In addition to a specification heet and attachment list, the booklet uggests other equipment which may e used with this tractor. Form 30379.

114

teel pipe production

Here is an unusual bulletin which hows you the step-by-step process y which high quality steel line pipe s produced by the joint manufacturing agreement between the Steel Division of Basalt Rock Co. and Kaiser Steel Corp. Kaiser produces nd rolls the steel plate, then delivers t to the Basalt plant where it gets a ickling bath and then goes through he process of forming, welding, sizng and testing. All this information s contained in 16 pages of photoraphs and text, and includes a table resenting the various sizes, thicknesses, and weight of Basalt-Kaiser ipe. Available from **Kaiser Steel** Corp.

115

ll about storage batteries

A newly revised booklet by **The Electric Storage Battery Co.** gives eatures, specifications and construction details for 20 types of batteries sed in such heavy-duty applications s gas- and diesel-powered trucks, ractors, and off-highway equipment.

116

ce control information

Use of calcium chloride treated brasives in highway ice control is he subject of the revised Manual M-1 by **Calcium Chloride Institute.** The 30-page illustrated bulletin includes recommended procedures, reating and storage of abrasives, and irect application of calcium chloride n ice control, plus tables and charts n skid test data, melting action of reated abrasives, and specifications.

117

Concrete paving

The latest methods and equipment sed for constructing concrete airorts and highways are outlined in llustrated 20-page booklet by **Heltzel** Steel Form & Iron Co., manufacturer f automatic batchers and batching lants, new type heavy-duty steel orms, and fast portable finishing machines. Bulletin M-12

118

Model 820-K shovel-crane

The versatile Lorain Model 820-K shovel-crane is the subject of a new 2-color, 24-page catalog just released by **The Thew Shovel Co.** It contains detail views of the operating mechanisms of the crawler, turntable and front end equipment, and explains the air controls and operation of the machine's hydraulic coupling. Includes coverage of features, performance information and many action views of the 820-K being used as a 2-yd. shovel, clamshell, hoe, dragline and crane.

119

Aggregate handling equipment

A 16-page color bulletin by **Noble Company,** manufacturer of materials handling equipment, describes its conveyors, elevators and accessories for aggregate handling. Photographs and drawings with explanatory text point out the salient features of the Noble belt-type conveyor, channel-type conveyor sections, truss-type conveyor sections, receiving hoppers, tunnel conveyors and bucket elevators. Includes a conveyor capacities table and a table on continuous bucket belt elevator capacities, plus data on conveyor pulleys, conveyor belt trippers, gates, traveling hoppers, ladders, catwalks, and swivel distributors.

120

Protection with Parlon

A 20-page illustrated booklet by **Hercules Powder Co.** describes 35 case histories of the successful use of protective coatings based on this chlorinated rubber product. Includes instructions. 500-197.

121

Facts about the Teredo

Here are all of the pertinent facts about the Acker Teredo, a simple, rugged core drill of medium capacity for depths to 500 or 600 ft. This 8-page Bulletin No. 30 has cutaway and action photographs which show how the Teredo's leading features (3-speed transmission, 24-in. travel, long rods, drill head which can be rotated 360 deg., etc.) save time on drilling jobs. Includes specifications and charts. Available from **Acker Drill Co.** Send in for a free copy.

122

Perlite plaster aggregate

"How to Specify and Use Perlite Plaster Aggregate" is a new 8-page brochure published by **Perlite Institute.** Contains specification data, information on the perlite industry's certification and labeling program for plaster aggregate, and 4 pages of practical hints on the cause and prevention of cracks in all types of plaster.

123

Catalog on asphalt plants

The new 36-page Catalog 848 recently released by **Barber-Greene Co.** illustrates the function, construction and salient features of all of the components of the high-capacity Model 848 series asphalt plants. The reader is shown how these basic plant components (the mixer, the dryer, the gradation control unit, the dust collector, and a host of accessory feeders, elevators and other units) can be combined into four separate plant set-ups, each designed specifically for a popular application. Featured is a 3-color, 2-page phantom view showing the "inside story" of operation of the entire plant from the cold aggregate feed through the mixer.

124

Booklets on petroleum products

Tide Water Associated Oil Co. is offering three new booklets on its line of petroleum products. One, "Petroleum Products For Every Use," is on Tide Water's complete line, including motor fuels, heavy-duty oils, Veedol preservative oils, gear lubricants, greases, heating oils, and miscellaneous. Another covers its complete line of Tycol industrial lubricants for various applications. The third, illustrated, booklet is on Tydol HD oils and answers all the "what," "why," and "how" questions about these oils to fight wear and reduce and clean out engine deposits. Includes a chart of recommended applications.

125

Industrial insulations

A 16-page bulletin by **Owens-Corning Fiberglas Corp.** offers complete information on its line of industrial insulations. Featured is a selective index to uses of this insulating material, plus other important charts and tables. Everyone interested in various pipe insulations, industrial equipment insulations, duct insulations and cold storage insulations should send in for this free literature.

126

Heavy-duty power control unit

The new Carco double-drum power control unit is the subject of Bulletin L-203 published by **Pacific Car & Foundry Co.** Covers specifications and performance characteristics of this heavy-duty unit, available for all makes and sizes of tractors.

127

First aid on the job

High quality first aid supplies in a redesigned case make up **Mine Safety Appliances Co.'s** new Type D first aid kits, covered in an informative illustrative folder. These carefully selected items are widely used by construction crews. Folder tells how each item from inhalants to bandages is rigidly controlled to pharmaceutical standards by a quality control procedure whereby every unit carries an identifying key number. Bulletin No. 0401-2

128

For treating masonry surfaces

A. C. Horn, Inc., is offering two bulletins on its products for protecting masonry surfaces. One describes Vulcaflex, an elastic coating designed for surfaces with either existing or anticipated cracks or crazed condi-

tions. The other covers Dehydratine No. 22, a silicone base water-repellent. Send in for free copies by putting key number on coupon.

129

Tells about truck engines

A new color folder and spec sheet, including a SAE gasoline engine test code, is available from **Hall-Scott Motor Division, ACF-Brill Motors Co.** The Hall-Scott truck engines for butane-propane and for gasoline fuels are described and pictured, with separate treatment to special features: unit construction, block and piston changeover, overhead camshaft, crankshaft, pistons, octopus intake manifold and high torque.

130

Lima bulletins

Baldwin-Lima-Hamilton Corp., Construction Equipment Division, has bulletins covering the Lima Type 44, a 1-yd. machine, and the Lima Type 803, a 2½-yd. machine. Tells capacities, working ranges and brief specifications.

131

Prefabricated steel buildings

Kyle Prefab Steel Co. is offering an 8-page color brochure on its Timepruf steel buildings featuring Stran-Steel nailable framing, for industrial and other uses. Drawings and photographs show you how to save both time and money by use of this framing system, which allows freedom of type, size and design selection. Includes specifications. Form No. 553

132

Spec sheet on rubber seals, etc.

American Rubber Manufacturing Co. has available, in blueprint style, a specification sheet showing government specifications, types and sizes—standard and special—of water stops used in concrete construction where expansion joints are required; gaskets for manholes, caissons, flood and canal gates, tank openings, ball joints on dredger pipe lines, etc.; rubber gate seals for dam and canal construction, spillway gates and tainter gates.

133

Conveyor catalog

Presenting a new conception of the economy, utility and simplicity of belt conveyors, a 60-page catalog has just been issued by **Barber-Greene Co.** showing its entire range of standardized belt conveyors. Each component and accessory is illustrated and described with line drawings showing the relationship of the unit to the entire conveyor system. Among the accessories listed are feeders, hoppers, supports, backstops, walkways, belt cleaners, hoods, gates, etc. A section on shuttle conveyors and stackers illustrates several economical stockpiling systems. (76A)

Literature briefs . . .

134

PRE-ENGINEERED BUILDINGS—Here is complete information on **Soulé Steel Co.'s** standard steel or aluminum pre-engineered buildings. Gives construction and engineering details and includes a pictorial review showing some of the varied materials, unit combinations and designs which add eye appeal to industrial and commercial buildings.

135

MASONITE BROCHURE — **Masonite Corp.** is offering a free booklet covering the facts about its concrete form Presdwood for cutting concrete finishing time.

136

ELECTRIC GENERATORS — **Homelite Corp.** has a 4-page catalog (L-411) on its line of carryable generators designed to supply emergency electric power. Includes explanation of various functions and uses of these units, specifications, electric output and price list.

137

D8 PUSHER—**Caterpillar Tractor Co.** has a new broadside complete with illustrations, including a detailed cutaway drawing, of its D8 pusher tractor. Contains detailed specifications. Form 30903

138

SCAFFOLDS — **Advance Scaffold Division, Beaver Art Metal Corp.,** is offering Folder No. 51 explaining the panel and brace locking feature of its stationary and traveling tubular steel scaffolds.

139

EUCLID SCHOOL—This colorful little folder tells you all about the 8 regular and the special training courses offered at **Euclid Road Machinery Co.'s** service training school for "Euc" operators and dealers.

140

PUMPS—Features, performance information, specifications and selection data for **Marlow Pumps'** line of municipal and industrial waste pumps are offered in a new 12-page bulletin. (W-52)

141

BULLETIN 2035—**Blaw-Knox Co.** is offering complete details on its steel forms for concrete construction.

142

CONVEYOR BELTING—Catalog 3679 by **Thermoid Western Co.** gives complete engineering data on its conveyor belting for mine, quarry and construction work.

143

LIGHTWEIGHT CONCRETE—If the specifications on your job call for lightweight concrete, you'll be interested in all the facts about New Basalite expanded shale aggregate for structural concrete. Offered by **Basalt Rock Co., Inc.**

144

BOX POINTS—For details about Esco Box Points and Adaptors for dippers and buckets send in for Bulletin 187-A by **Electric Steel Foundry Co.**

145

SOIL COMPACTION—"Cost Data for Soil Compaction in Restricted Areas" is the subject of a booklet offered by **Barco Manufacturing Co.,** manufacturer of the Barco Rammer for soil compaction work.

146

CONVEYING SYSTEMS — **Stephens-Adamson Manufacturing Co.** is offering complete information on its line of equipment for conveying systems.

147

SIX ENGINES—Here is an 8-page booklet describing 6 sizes of industrial and marine engines and diesel-electric sets. Explains how these units are designed to fit specific needs of many power users. Numerous illustrations demonstrate applications. Form 30743 by **Caterpillar Tractor Co.**

148

THE LS-85 — **Link-Belt Speeder Corp.** is offering Catalog 2317 on its heavy-duty ¾-yd. shovel-crane, the LS-85.

149

ASPHALT PLANTS—Full descriptive literature is being offered by **Standard Steel Corp.,** manufacturer of 8 sizes of asphalt plants, with 500- to 6,000-lb. batch capacities.

150

ASBESTOS FLEXBOARD—A 12-page brochure by **Johns-Manville** tells about this non-combustible asbestos-cement building board, how it is made, handled, and applied. Illustrated with sketches and detailed drawings covering both outside and inside work.

151

BLUE BRUTES — **Worthington Corp.** is offering all the facts about its Blue Brute compressors, featuring reserve power, easy maintenance, and fuel economy.

152

SKID-SHOVELS—A colorful illustrated bulletin by **Drott Manufacturing Corp.** tells all about its Skid-Shovels for mounting on International TD-6, TD-9, TD-14A and TD-18A tractors. Catalog 104.

153

TIRES—Learn the latest tire information by sending in for this new 64-page bulletin offered by **United**

States Rubber Co., manufacturer of U. S. Royal tires. Includes engineering and service aids, load and inflation tables, dual matching and weight charts.

154

SLING HANDBOOK—"Tuffy Sling Handbook and Rigger's Manual" will tell you all about using **Union Wire Rope Corp.** slings on construction projects.

155

CONCRETE VIBRATORS—Find out full information on **Marvel Equipment Corp.'s** concrete vibrators by sending in for free literature.

156

SAFETY FIRST—B. F. McDonald Co. is offering a bulletin on its Fold-Back face shield for extending head protection to face and eyes. This safety device fits McDonald "T" and "P" type hats.

157

HAND HOISTS—Coffing Hoist Co. is offering informative literature on its complete line of hand-operated hoists.

158

CARPULLERS — Superior-Lidgerwood-Mundy Corp. is offering bulletins and catalogs on its capstan-type and drum-type Carpullers for easy moving of heavy rolling loads.

159

BULLETIN 4105 — Traylor Engineering & Manufacturing Co., manufacturer of Type H and HB jaw crushers, is offering Bulletin 4105 on how to control costs on job-produced aggregate.

160

BUCKETS—Wellman Engineering Co., manufacturer of dragline, clamshell, custom-built buckets, stone and wood grabs, is offering descriptive bulletins on its products.

161

PILE HAMMERS — McKiernan-Terry Corp. is offering a bulletin on its equipment for pile driving power.

162

ASPHALT PLANTS — A circular being offered by **White Manufacturing Co.** describes its stationary asphalt plants for hot-mix paving jobs.

163

SURVEYING INSTRUMENTS — Union Mercantile Co. has free folders on its quality transits and builders levels for surveyors and engineers.

164

MALL PRODUCTS—For full facts on all Mall construction tools—concrete vibrators, chain saws and portable tools—put key number on coupon and send in for free literature. **Mall Tool Co.**

165

DOZER ROPE—A free illustrated folder by **Union Wire Rope Corp.** describes its special Tuffy dozer rope.

166

FAST STARTING — When zero weather means headaches about starting time on the job, you'll be interested in finding out about Chevron Starting Fluid for instant gasoline and diesel engine starting. **Standard Oil Co. of California** is offering a free folder on this product.

167

PAVING BREAKERS—Descriptive bulletins by **Joy Manufacturing Co.** tell all about the cadmium-plated Joy paving breakers, which are easily convertible to sheeting drivers.

168

WIND TUNNELS—Wind tunnel construction is the subject of a brochure by **Pittsburgh-Des Moines Steel Co.,** which has had plenty of experience in engineering and constructing these difficult platework projects.

169

LINK-BELT LINE—Catalog 2373 will tell you all about **Link-Belt Speeder Corp.'s** complete line of crawler, truck and wheel-mounted shovel-cranes.

170

BUILDING HIGHWAYS—To find out about Telsmith aggregate plants for highway construction work, put key number on coupon and send in for a free copy of Bulletin 266 by **Smith Engineering Works.**

171

BALANCED BOGIE—It's the advantages of the exclusive Balanced Bogie and Power Divider on Mack 6-wheel trucks which is the subject of a booklet now offered by **Mack Manufacturing Corp.**

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Organization.....

NEW EQUIPMENT

More information on any of the items in this section may be obtained by using coupon on page 133.

172

New design simplification features Eimco 105 tractor loader

Eimco Corp. is introducing its heaviest machine, the 105 prime mover, a 34,000-lb. tractor loader which has numerous design and operating improvements. Its new Unidrive Transmission is top feature, containing, in one compact unit, all of the gearing and clutches for speed changing, and full independent reversal of each track for improved maneuverability. The design combines all of the best features of torque converter, constant mesh gearing and hydraulically actuated friction clutches with sealed oil bath, pressure lubrication of all wearing parts.

Controls are actuated by only two small handles. Units now in production use a 90-hp. diesel engine with matched torque converter. This tractor loader, available with its own excavating equipment and other tools, includes the firm's rocker-arm principle. Bulletin L1032 is available.

173

Two acres per hr. is the record for new LeTourneau tree saw equipment line

A recent land clearing demonstration by **R. G. LeTourneau, Inc.,** showed how its new self-powered, mobile tree saws did the job at better than 2 ac. per hr. Key machine in the new line is the Tournasaw, which is characterized by an electrically-powered circle saw on a pivoting boom which will selectively cut all the trees in a 250-sq. ft. area immediately in front of the unit, and an overhead "pusher boom" which directs the fall of trees in parallel positions. In addition, the saw is able to cut trees flush with the ground. Two other land clearing machines are the LC tractor and Tree Stinger. The latter features a 34-ft. telescoping boom which will extend an additional 19 ft. to push or pull over trees not normally accessible to mechanized saws. All of this new LeTourneau equipment embodies the principle of diesel-electric drive and 4-wheel steering, with individual electric motors powering each wheel and separate steering motors for front and rear

wheels. This land clearing demonstration also showed the LeTourneau Land Clearing Blades in action. These blades have a pressure bar at the top which puts a tension on small trees, permitting the cutting edge at the bottom of the blade to shear them off cleanly. Literature on this new land clearing line is available.

174

Madsen 4,000-lb. batch asphalt plant designed for fast, accurate production

The new Madsen Model 481 has new and improved features that will enable the owner to meet more exacting mix specifications, obtain faster production and reduce servicing and maintenance costs. The plant is oversize throughout. It has larger elevator, screen, bin, weighbox, mixer and drives. While designed as a 4,000-lb. plant, the

"481" is engineered so that it may be modified if desired to handle 5,000- or 6,000-lb. batches. The method of withdrawing materials from the 4-compartment aggregate bin is said to be unique in the industry. Materials from each compartment are withdrawn through three openings—one in the center and one at either edge of the bin bottom. When the single gate which covers the three outlets is opened, the material in the bin is drawn down from the

two bin sides and the center. This eliminates "coring out" and segregation and provides a more uniform withdrawal of material and a more active bin condition. To reduce time and labor in servicing of the mill, the plant's weigh-box is roller mounted so that it may be rolled away from the top of the mixer for easier and faster mixer tip or shank replacement. The plant is designed basically to utilize a 42-in. x 12-ft. or 48-in. x 12-ft. Symons double-deck screen or a Symons 48-in. x 14-ft. 2½-deck screen. Drives may be all electric or combination diesel and electric. For use with the "481," **Madsen Iron Works** has announced a new twin-shaft pug mill mixer, known as the Madsen Model 440 and available in 4,000-, 5,000- and 6,000-lb. capacities. This mill has improved mixing action, faster discharge and built-in oversize capacity. Designed to be completely portable, the plant's units are all within legal road widths and may be transported by semi-trailer. For complete information and specifications, put key number on coupon.

175

Model 8 Adnun Jr. is better built paver for handling smaller bituminous jobs

With a working speed of up to a recommended maximum of 40 ft. per min., the Model 8 Adnun Jr. black top paver has been described by the manufacturer, **Foote Construction Equipment Division, Blaw-Knox Co.**, as a better built, economical, bituminous paver for handling smaller asphalt paving jobs. Its features are: a big, roomy hopper with low set raker bar for better compaction; dual controls; anti-friction bearings; oscillating cutter bar to cut off pavement but not to scrape it off to leave subsurface tears; overlapping cutter bar action for carrying

material and compacting with the parallel course; continuous course correction to lay accurate template to produce a smoother surface. The frame is of heavy-duty, box-type design capable of withstanding years of service. Overall width is 110 in.; height 49 in.; length 77 in. Literature is available.

176

One-man crane carrier has independent power supply

An independent power supply permitting independent travel and swing is top feature on a new one-man type crane carrier, the CW-312, recently developed by **Cook Bros. Equipment Co.** The power plant, which is assembled on a sub-frame, consists of a 100-hp. gasoline industrial engine, torque converter, 3-speed and reverse transmis-

sion, auxiliary transmission with emergency and/or parking brake. All these components are easily accessible for service and maintenance. There is no transmission of power between carrier and crane because of this independent power plant, thus eliminating crane travel gear, clutches, etc., and the necessity to have any part of the crane mechanism in operation to propel the carrier. The result is substantial savings in both crane mechanism and maintenance costs. Literature is available to all interested parties.

177

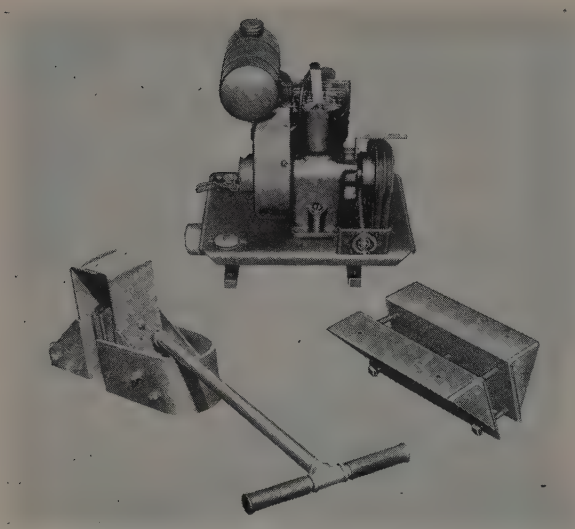
Combination proportioning, mixing and elevating machine for concrete gunning

The Mix-Elvator, a portable self-contained unit, is a new combination proportioning, mixing and elevating machine with a readily-adjustable ratio control that permits an accurate mixing range from 1:3 to 1:8. Its engine speed can be adjusted to give a mixing and elevating capacity from 2½ to 8 cu. yd. per hr. in order to insure continuous operation under all conditions for all types of concrete gunning equipment. The material or aggregate needs to be handled only once during the operation because of a complete screening arrangement and a single clutch control. Manufacturer is **Air Placement Equipment Co.**

178

Package-type vibrating screed available

Contractors should be interested to learn that there is now a vibrating screed on the market which can be sold as a package so that it is possible to build one's own unit inexpensively. Slabs up to 30 ft. in width can be surfaced. Manholes and other obstructions pose no problems because the screed works right up to and around them, leaving the slab surface in almost finished condition. Its heart is the efficient motor unit, the "Power-Pak," which consists of a 2-hp. Briggs & Stratton gasoline engine and a built-in vibrator. It is mounted on a multi-plane base,

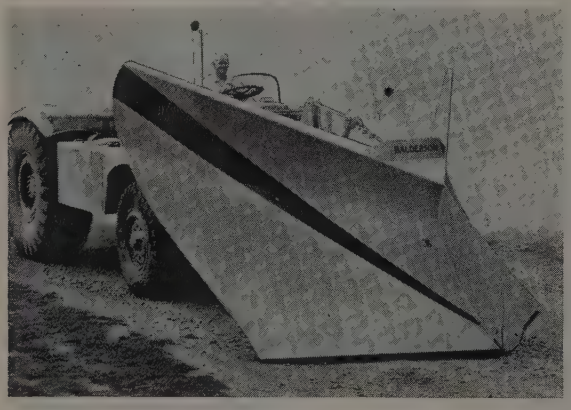


fitted with 4 vibration dampeners, which completely isolates the engine from the screed's vibration. The engine features a throttle control by which the operator may vary the frequency of vibration from 3,600 to 4,800 vpm. to best accommodate the consistency of the mix being placed. Manufacturer is **Stow Manufacturing Co.**

179

V-type snow plow clears the way

A new V-type snow plow (BV110) for mounting on a Caterpillar DW10 wheel-type tractor permits high speed snow clearance for all types of highways and streets. The



plow consists of a moldboard, removable cutting edges, adjustable shoes, removable nosepiece, adjustable push arms, lever arm, lift arm, lift arrangement and necessary bolts and pins for mounting. A single-acting hydraulic ram powered either by a hand hydraulic pump or by an electric pump is available for lifting. Manufacturer is **Balderson, Inc.**

180

Portable mixer suited for any season

The HTD-500 Multi-Pug asphalt mixer has been added to the line of portable asphalt mixers manufactured by **K. E. McConnaughay.** Reported to be suited to hot or cold patching in any season under wet or dry conditions, it is precisely engineered, rigidly constructed and thoroughly tested in handling on-the-job mixtures of asphaltic concrete, sheet asphalt, sand asphalt, or mastic asphalt at high production rates. It reactivates and heats stock-pile mixtures up to 15 tons per hr.; prepares cold asphaltic mixtures up to 30 tons per hr., and hot asphaltic

mixtures up to 10 tons per hr. It dries various types of wet aggregates quickly and thoroughly; removes both moisture and solvents from bituminous mixtures; processes tars, paving asphalts, cut-back asphalts and emulsified asphalt.

181

Hydraulic crane meets indoor-outdoor needs in materials handling field

A lightweight, fast moving crane, self-propelled and hydraulically operated, is reported to combine the best features of crawler, truck and erection cranes with those of industrial shop cranes. Four functions are involved: turntable rotation, boom elevation, raising and lowering of cable and hook, and power extension and retraction of the boom. All movements, including steering, are actuated by hydraulic power. Features and specifications are as follows: 360-deg. boom rotation; 24-ft. horizontal reach from center of rotation; 24-ft. vertical lift from ground level to hook; ability to negotiate grades up to 20%, under full load; 15-mph. road speed, under full load; over-all height of 9 ft., and over-all width of 8 ft. Manufacturer is **Austin-Western Co.** Free literature.

182

International Harvester has two new 4-wheel-drive trucks

Specifically designed for use in rough terrain are the International R-140-4x4 (gross weight vehicle rating 11,000 lb., in 130- or 142-in. wheelbase), and the R-160-4x4 (gross vehicle weight rating 15,000 lb., in 154- and 172-in. wheelbase). These 4-wheel-drive models give the added traction and flotation needed for off-highway work. The smaller model is powered by a 100-hp. International Silver Diamond 220 engine with a maximum torque of 173.4 at 2,000 rpm., and the larger is powered by a 108-hp. International Silver Diamond 240 engine with maximum torque of 192 at 1,400 rpm. Manufacturer is **International Harvester Co.** Literature is also available (CR-804-C).

183

Hopper conveyor can be used as spreader, too

A new model hopper conveyor for filling trenches, curbing, ditches, pipelines, etc., has unusual flexibility because it has a removable conveyor which permits the hopper to be used

as a spreader and the conveyor section to be utilized as a separate material and supply handling unit. This machine is towed by the truck as it dumps its load into the hopper feeding belt. Speed of the towing truck and conveyor belt, and amount of material being carried by the belt, control the rate of fill delivered. This Model 600 is powered by an 8-hp. gasoline engine which drives the 14 in. wide conveyor belt. Maximum capacity is 3 tons per min., and maximum belt speed is 500 ft. per min. Manufacturer is **Power-Pack Conveyor Co.** Literature is also available by putting key number on coupon and sending in for free information.

184

Exhaust silencers quiet operations

Series CA and LCA silencers for quieting the noise produced by air compressors, blowers, vacuum pumps and other machines expelling high velocity air have been developed by **Burgess-Manning Co.** They are designed for operation under moisture-free air conditions and for temperatures up to 200 deg. F. Series CA is available in pipe sizes up to 6 in. and the LCA series for larger pipe sizes. Literature is also available.

185

Four new "Quick-Way" truck shovels on the market

"Quick-Way" Truck Shovel Co. is announcing a complete new line of small capacity truck shovels which stress convertibility with 5 booms: crane, shovel, trench hoe, front dump shovel and scoop. With these booms the "Quick-Way" special attachments, such as the new hammer drive clam, dragline, clamshell, magnet, pile driver, log grapple, back-filler blade, telescoping boom and skull cracker, put the operator in a position to handle profitably numerous jobs, both large and small. Capacities of this line of truck-mounted equipment are as follows: L-2, ½ yd., 10-ton crane; E-2, 4/10 yd., 7½-ton crane; S-2, ⅔ yd., 5-ton crane; J-2, ¼ yd., 3½-ton crane.

186

Wire reinforces steam hose

Endurance wire braid steam hose is a new industrial rubber product developed by **Hamilton Rubber Manufacturing Corp.** It is recommended for saturated steam pressures

up to 200 psi., or for superheated steam up to 385 deg. F., and can be used for high pressure steam service, heating bituminous binders and various other applications.

187

New size water stops available

Water Seals, Inc., has a new 3-rib (intermediate) size addition to its Labyrinth line of polyvinyl plastic water stops. Available for all classes of concrete work—for walls, slabs, footings, etc. It assures a permanent water-tight seal between concrete pours.

188

New trencher is low-cost, heavy-duty, mounts on Oliver

A new Universal trencher, specifically designed for mounting on the Oliver OC-3 crawler tractor, does neat and speedy trenching of gas and water mains, service lines and irrigation and drainage ditches. Some features of this low cost, heavy-duty equipment are: 4-ft. depth of excavation, digging width control with bolt on clearance teeth, 6 digging speeds, adjustable and reversible soil conveyor, hydraulic control for fingertip operation, safety clutch and hydraulically controlled backfiller blade. Manufacturer is **Heller Engineering & Manufacturing Co.**

189

Safety signs available

Here is an assortment of easily applied safety signs which stick onto any smooth surface. They can be removed without harming the surface and are suitable for either indoor or outdoor applications. Available in over 200 stock descriptions, three different color combinations and two sizes. Manufacturer is **Western Products Division, Western Lithograph Co**

190

Crushing plant features large units on single chassis

A new, single-unit rock crushing and screening plant, Model 33R, has been designed for rapid production of aggregates. It features the exclusive Pioneer triple roll crusher which enables two simultaneous passes at the rock. This feature in turn permits placing all units of the plant on one chassis for faster and more economical operation and "moves" than is possible with a multiple-chassis unit. Units include an 18- x 30-in. jaw crusher, an apron feeder mounted on the plant, a 1½-deck sizing and separating screen and a 30- x 18-in. triple roll secondary or reduction crusher. Recommended for road building and other jobs where larger units, a high degree of portability and easy plant set-up are required. Manufacturer is **Pioneer Engineering Works, Inc.,** subsidiary of **Poor & Company.** Bulletin 645 is available.

191

Dust hood keeps out sneezes

This 5-oz. roomy cloth hood is just the thing to wear while working in places where nuisance dusts are present. Picture window offers unrestricted vision in all directions. It may also be worn with a respirator. Manufacturer is **General Scientific Equipment Co.**

192

Portable pump is self-priming unit

A new self-priming portable pump is available for dewatering flooded areas, pumping out pits or quarries, and other construction uses. This Kenco 114 model delivers over 100 gal. per min. at lowest head, and is capable of forcing water to a maximum height of 100 ft. High suction lift is assured up to and including 25 ft. of lift. Manufacturer is **Kenco Pump Co.**

193

New package unit for field welding and power

Here is a self-contained 300-amp. DC field welding and AC power supply unit for convenient and flexible operation. Powered by a 20-hp. Onan CW 2-cylinder, air-cooled gasoline engine, the output of the alternating current generator can supply 10 kw. of standard 60-cycle AC power for 3-phase and single-phase power applications. Manufacturer is **Miller Electric Manufacturing Co.**

194

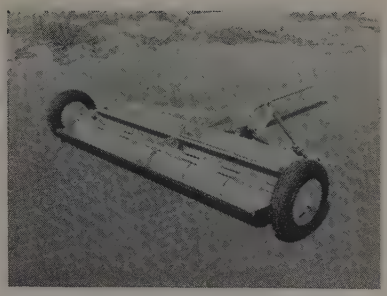
Snow bucket developed for Gradall use

Another new standard accessory for the Gradall is a snow removal bucket which is designed particularly for maintenance work in metropolitan areas. Attached to the end of the Gradall's 24-ft. telescoping boom, the bucket clears out places inaccessible to conventional snow removing equipment. Straight sides of the bucket facilitate snow disposal; and because the boom rotates 360 deg., snow can be dispersed readily within a 24-ft. radius. The new bucket is 60 in. wide, 32¼ in. deep and weighs 585 lb. Manufacturer is **Warner & Swasey Co.**

195

Magnetic sweeper takes tire hazards off road

Both practical and efficient, the non-electric Magnetic Road Sweeper, manufactured by **CESCO,** gets rid of the nails, wire and other ferrous hazards to rubber-tired traffic. Available in standard sweeping widths of from 4 to 8 ft., these sweepers are supported on cold rolled steel frames with 16-in. heavy-duty pneumatic tired wheels. Easily operated, stainless steel magnetic plate covers dump collected tramp iron into the built-in



retainer pans. These units operate safely in all kinds of weather and on both smooth and unpaved areas. Bulletin No. 450 is also available.

196

V-8 engines featured on new Dodge trucks

New efficient and advanced V-8 truck engines are among the 7 power plants in the new C-1 Series of Dodge "Job-Rated" trucks, which are claimed to meet about 98% of all hauling needs. The 7 engines range from 100 to 172 gross hp.; gross vehicle weights range from 4,250 to 40,000 lb., and gross combination weights range up to 60,000 lb. The V-8 power plants are offered in three horsepower ratings: 133 hp. in 1½-, 2- and 2½-ton models; 153 hp. in 2¾-ton models, and 172 hp. in 3- and 3½-ton models. Some of the 75 other new features in the C-1 Series are power steering, more compact tractors which permit larger payloads, a new improved steering linkage, lower loading height, and increased driver comfort and visibility. Manufacturer is **Dodge Division, Chrysler Corp.**

197

Reinforced sewer pipe has special type joint

A special type "Armored Joint" which combines steel joint rings and long-lasting rubber gaskets to insure against leakage or infiltration, is now available on reinforced sewer pipe manufactured by **Universal Concrete Pipe Co.** The rings, embedded in the concrete pipe wall, are welded to the pipe's steel reinforcement. This type joint has long been used on pressure pipe and can be made to conform to any standard specification for reinforced concrete pipe.

198

New gun developed for lightweight spot welding

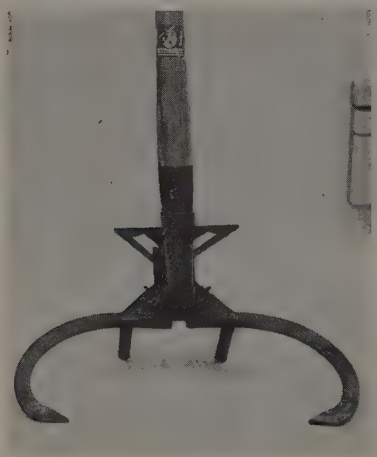
The new Aircospot Gun for lightweight spot welding uses a 3/32-in. non-consumable thoriated tungsten electrode and an inert gas shield for instantaneous welds on stainless steels, mild steels and alloy steels,

without the aid of jigs or fixtures. The Aircospot unit consists of a hand gun, control panel and all necessary hose and cable assemblies. Manufacturer is **Air Reduction Pacific Co.**

199

New tool for safe, easier power pole erection

The Pengo Pole Grip, a completely new tool for safely setting up power poles through energized power lines, does not replace the peavey but does



a different job. It enables one man to have complete control of the butt of the pole to safely guide the top of it up between power lines. Manufacturer is **Peterson Engineering Co.**

A1

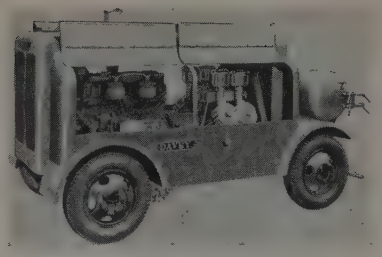
New device prevents crane boom accidents

Crane accidents can now be stopped before they start—by use of the new Rud-o-Matic Thomas Boomstop, which automatically cuts off power the moment the boom is raised too high. Dual spring-loaded rams, mounted on the "A" frame or gantry of the crane, provide a soft, cushioning effect, and arrest boom movement when a load cuts loose and boom whips back. Operated by two vacuum valves and requiring only occasional inspection, two models are available: Model 5000, for small cranes up to 20-ton capacity, and Model 10000, for cranes from 20- to 100-ton capacity. Manufacturer is **McCaffrey-Ruddock Tagline Corp.** For more information send in for Bulletin No. 101.

A2

Portable compressor has 600 cu. ft. per min. capacity

Its largest capacity portable diesel-powered compressor, the Super Chief 600, has been announced by **Davey Compressor Co.** This new 600-cu. ft. per min. unit is available in both skid and 4-wheel trailer mounting styles. Standard features include automatic compressor-engine controls; individually finned, separately replaceable



cylinders; full force-feed lubrication; cast aluminum crankcases, Multi-Port valves; automotive type steering; full spring suspension, and double, built-in, full length tool boxes. The 4-wheel trailer model (illustrated) is 150 in. long, 75 in. wide and 95 in. high. Net weight is 9,300 lb. Skid dimensions are 150 in. by 63 in. by 69 in. Skid weight is 8,700 lb.

A3

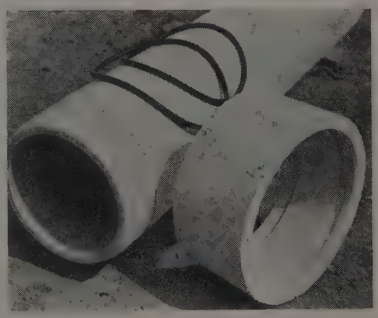
One coat of Counter-Rust keeps out corrosion 5-10 yr.

It only takes one coat of Adelphi One Coat Counter-Rust to protect steel structures from corrosion for from 5 to 10 yr., according to the manufacturer, **Adelphi Paint & Color Works, Inc.** It can be applied on any steel structure over any film of paint in fair to good condition. Minor rust spots will be isolated and neutralized by this new product.

A4

Coupling cuts pipe installation time

Ring-Tite, a new coupling developed for use with Transite pressure pipe, is reported to cut down expected installation time because it automatically centers, aligns and provides for expansion. Furthermore, it can be quickly assembled even under adverse trench conditions or under



water. For making the assembly, first pop the rings into their grooves in the sleeve. Next, spread the pipe ends with a lubricant which the manufacturer furnishes for this purpose. Then align the pipe roughly and attach the puller. An easy pull completes the job. Manufacturer is **Johns-Manville.**

A5

New tire has steel claws

There are over 5,000 steel claws in the tread of a new heavy-duty express truck tire manufactured by **B. F. Goodrich Co.** Offers sure-footed traction on rain-slippery roads and cuts through ice and snow in winter. Also assures straight-line stops and faster starts.

A6

Points and adapters are quickly changed and tough

Electric Steel Foundry Co. has developed the R-7 series of versatile points and adapters with lightning change features and tough wearing qualities. The quick change feature eliminates the cumbersome job of replacing the heavy base when repointing or sharpening is necessary. Worn parts can be replaced in a few minutes. This R-7 series is for 5- to 15-yd. shovels.

A7

"Easy shifting" is keynote of all position rear blade

A unique but sturdy suspension arrangement enables the driver of lightweight tractors to switch the position of the new 400-lb. Model 200 rear blade without leaving the driver's seat. The blade can be extended to either side of the tractor with the blade angle either right or left. Man-

ual adjustments can extend it 3 ft. beyond the wheels on either side of the tractor or to a tilt position permitting the unit to dig "V" ditches and similar work with maximum efficiency. Ditches, when wet, will keep the tractor wheels on solid ground for position with the latter adjustment. This blade is instantly reversible for back blading. Manufacturer is **Shawnee Manufacturing Co.**

A8

New 20-lb. chain saw offered

A new, low-priced, gasoline-powered chain saw that weighs only 20 lb. complete with blade chain is announced by **McCulloch Motors Corp.** Its light weight, combined with its ability to saw full power in any position without adjustment, makes the Model 33 ideal for both tree removing and cutting construction timber, props and ties.

A9

Fast mounting featured on Davis hydraulic loader

The new Davis hydraulic loader features 12-min. mounting time which is achieved by a simple 4-pin attachment after the initial installation of

the mounting brackets. Of 100% box-frame type construction, attachments are the Davis Concrete Buster, a material bucket, an oversize utility bucket, a dozer blade, and a crane. Available with an unconditional guarantee from **Midwestern Industries, Inc.**

A10

Side cab truck chassis designed to haul readymix

A one-man cab over the left front wheel is featured on a new type of truck chassis designed to haul pre-

mixed concrete. This cab gives the driver all-around visibility in traffic and at the construction site. The truck has 6-wheel drive, power steering, a White 160AX gas engine, and is designed to carry 6 cu. yd. of pre-mixed concrete. Its wheelbase is 186 in., overall chassis length is 243½ in. With this wheelbase, load weight is distributed so that 11,400 lb. is supported by the front axle. Manufacturer is **Pacific Building Materials Co.**

A11

Spreader is easy to operate, sturdy, self-contained unit

The new 1954 fully equipped Model E Hi-Way Spreader has been redesigned from previous models, with emphasis on sturdier construction and on increased ease and efficiency of operation. This self-contained truck-mounted unit can be mounted or dismounted from the truck frame in 1 or 2 hr. It spreads sand, aggregate, salt and cinders for seal-coat work, dust control, road stabilization and ice control. Manufacturer is **Highway Equipment Co., Inc.**

A12

Do sloping with grader on top of the road

Engineered to eliminate expensive road re-shaping by hand is the Grade-More Slope Grader, which is reported to cut perfect fore-slopes and shoulder lines in one operation while the grader stays on top of the road. The 16-ft. mold board is suspended from the side of the motor grader and down the slope to cut the road slope to any desired degree. Claimed to be

ideal for removing gravel and rock from ditches, the Grade-More mold board is controlled from the operator's seat through the regular grader controls. Manufacturer is **Hasselbalch Fintzell Co.**

A13

Tailgate loader lifts 2,000 lb.

A new and improved Heiloader hydraulic-powered, elevating truck tailgate is now available from **The Heil Co.** The unit can be mounted on any truck and can lift a maximum 2,000-lb. payload. New safety features are included in its design.

A14

Safe parking insured by 30-lb. wheelblock

A new heavy-duty safety wheelblock provides positive holding on any surface, including ice and wet pavement. Its 14-in. height and 15 x 10-in. base (with heavy steel gripper

teeth) prevent a vehicle from rolling up over or pushing it into the ground, regardless of the vehicle's weight or the condition of the grade. Manufacturer is **Calumet Steel Castings Corp.**

A15

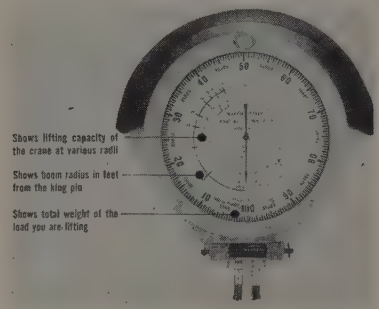
Telescopic truck hoist ups payload capacities

Hercules Steel Products Corp. has a new front-mounted telescopic truck hoist designed especially for heavy-duty dump truck bodies 11 to 15 ft. long. This 20-ton capacity hoist provides up to 1,000 lb. extra legal payload by shifting hoist weight forward on the front axle.

A16

Crane weight indicator is accurate, dependable

A simple dual hydraulic system employing a direct load pressure transformer makes it possible for the new Martin-Decker crane weight and radius capacity indicator to show the operator the exact boom radius at



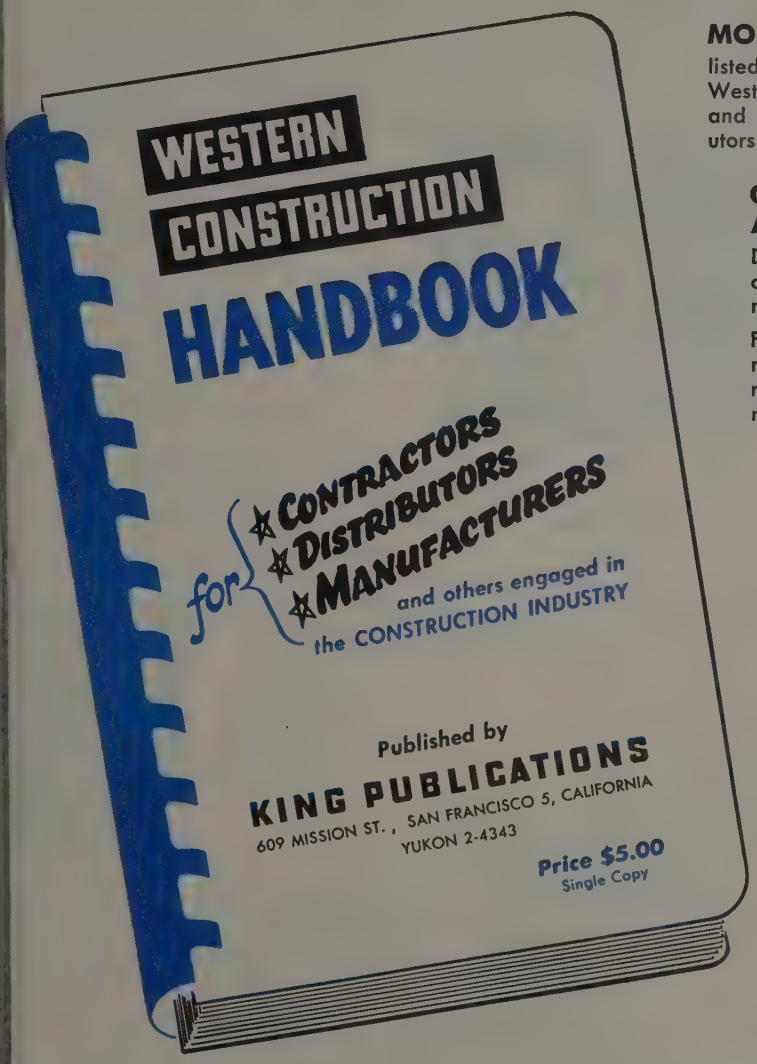
which he is operating, the safe capacity of his crane at that radius, and the exact weight he is lifting in pounds. If cranes are loaded according to rated capacities and this instrument is used to show loads being lifted, crane operation can be safe and dependable. Literature on this new product is also available. Manufacturer is **Martin-Decker Corp.**

A17

Onan is offering a 50-kw. electric plant

Designed for any type of job requiring heavy-duty primary or emergency stand-by power, the Model 50KA electric plant will deliver a full rated 50,000 watts at 80% power factor with ample overload capacity. Its International Harvester gasoline engine delivers 104 hp. at 1,800 rpm., and has a 450-cu. in. piston displacement. This 62.5-kva. unit is equipped with replaceable cylinder liners, roto exhaust valves, oil bath air-cleaner, and a remote 12-volt starting system. Manufacturer is **D. W. Onan & Sons, Inc.**

Can you use this information?



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News of DISTRIBUTORS

WATCHING *G. M. (Jerry) Gehrke*, vice president and general manager of Western Equipment Co. of Boise, Idaho, sign a sales and service agreement as distributor for LeTourneau-Westinghouse Co. are (from left) *A. W. (Buzz) Travis*, L-W district sales representative; *Harry Powers*, L-W domestic sales manager; and *Fran Duke*, L-W Western sales manager.

LeTourneau-Westinghouse announces Western distributors

Distributors in Boise, Idaho, and Denver, Colo., have been selected to represent LeTourneau-Westinghouse Co. in their respective territories. Western Equipment Co. of Boise has been named distributor for southwest Idaho and eastern Oregon. In addition to the LeTourneau-Westinghouse line of Tournapulls, Tournatractors, and tractor scrapers, Western handles Link-Belt, Diamond Iron Works, Schramm Compressor, Galion Iron Works and Mack Truck accounts. C. M. (Jerry) Gehrke is vice president and general manager.

Liberty Trucks and Parts Co., Inc., of Denver, will distribute the LeTourneau-Westinghouse line in Colorado and northwest Nebraska. Other lines include Austin-Western, FWD, J. I. Case, Oliver, and Seaman Motors. R. F. Carlson is president of this firm.

Royce Equipment moves

Ken Royce Inc. and Ken Royce Equipment Co. have moved their main office to 205 South Linden Ave., South San Francisco. The construction equipment yard and repair shop remain at the old address in San Francisco, 185 Bayshore Blvd. All building materials and quarry products are being handled as before through the South San Francisco office.

Hensley appoints Lively distributor

Lively Equipment Co. has been named distributor for the complete line of the Hensley Equipment Co. of Oakland, Calif. Lively Equipment Co. is located in Albuquerque, New Mex., and also at El Paso, Tex., where they are prepared to handle Hensley heavy-duty dozer rippers and brush rakes, scraper rippers, track rollers, etc.

New sales head for Smith Booth Usher

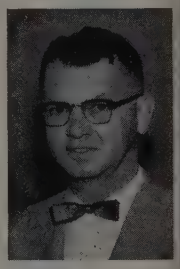
Smith Booth Usher Co., Los Angeles, announces the appointment of Albert W. Ginther as sales manager. Ginther is a graduate engineer and has spent most of his business life in the heavy equipment field. At one time he was district manager for Harnischfeger in Southern California and Arizona and most recently he was general sales manager for Wood Manufacturing Co., North Hollywood.

New parts rep. for Caterpillar

Appointment of J. F. Nullmeyer as parts department representative in Southern California, Arizona, and southern Nevada is announced by J. E. Ferguson, Western division parts manager for Caterpillar Tractor Co. Headquartering in Southern California, Nullmeyer will work with the following Caterpillar dealers: San Diego Tractor & Equipment Co., San Diego; Shepherd Tractor & Equipment Co., Los Angeles; Wallace Machinery Co., Oxnard; Davies Machinery Co., Hanford; Treanor Equipment Co., Visalia; Faure Tractor & Equipment Co., El Centro; Hartnett Machinery Co., Blythe; Braden Machinery Co., Yuma, Ariz.; Arizona Machinery Co., Phoenix, and James Cashman Co., Las Vegas, Nev.

New home for Interstate Tractor

Interstate Tractor and Equipment Co. is occupying its new building on Highway 99 just north of Eugene, Oregon. The new 40,000 sq. ft. building includes service shops, parts warehouses, offices and customer service docks. The firm provides sales and service for Caterpillar, Skagit, Hyster, Athey, Fleco, and U. S. Steel products. Layton K. Nosler is manager of



***Layton K. Nosler* manager of Interstate Tractor and Equipment Co. new store**

NEW HOME of Interstate Tractor and Equipment Co. at Eugene, Ore., is 187 x 200-ft. concrete building, located on a 5½-ac. tract of land.

SOULE' STEEL CO.'s new plant and warehouse at Seattle, Wash., is built of steel frame with corrugated aluminum roof and siding. A 5-ton traveling crane serves the entire 355-ft. length of the building.

the facility. Floyd Fleming has charge of the service shop, Don Leal is parts manager, and the industrial field salesmen are Art Bish, Tom Stevenson and John Chapman.

New division for Gar Wood

Gar Wood Industries, Inc., announces the organization of the Mattoon Division to handle production of Gar Wood bulldozers and road machinery sold through Allis-Chalmers industrial tractor dealers. Hunter Dietz is named Mattoon division manager; Dave Davis tractor equipment sales manager and Arthur C. Evans chief engineer, tractor equipment. In conjunction with formation of the new division, Gar Wood's bulldozer and road machinery production facilities are being greatly expanded. The new division will also provide modern straight-line production facilities for the St. Paul Hydraulic Hoist division which is moving from Minneapolis to Mattoon. The sale of St. Paul products in the West will continue to be handled through the following distributors:

Arizona—Fruehauf Trailer Co., Phoenix.

California—Fruehauf Trailer Co., Fresno; Standard Auto Body Co., Oakland, and Sierra Tank & Steel Corp., Reno, Nev.

Colorado—Timpte Bros., Inc., Denver; Sutton Machine Shop, Chappell, Neb.

Idaho—Fruehauf Trailer Co., Boise, Idaho, and Spokane, Wash.

Montana—Johnson Distributing Co., Great Falls, and Fruehauf Trailer Co., Spokane, Wash.

Nevada—Sierra Tank & Steel Corp., Reno; Standard Auto Body Co., Los Angeles, and Fruehauf Trailer Co., Salt Lake City, Utah.

New Mexico—Fruehauf Trailer Co., El Paso, Tex., and Timpte Bros., Inc., Denver, Colo.

Oregon—Fruehauf Trailer Co., Portland and Boise, Idaho.

Washington—Fruehauf Trailer Co. at Seattle, Spokane and Portland, Ore.

Wyoming—Johnson Distributing Co., Great Falls, Mont.

Soulé occupies new Seattle headquarters

Soulé Steel Company's new Seattle plant at 4100 West Marginal Way is open for business. The new building, which includes 30,000 sq. ft. of floor space, includes a fabrication plant and warehouse to provide complete service for Washington, northern Idaho, Montana and Alaska. Ernest J. Gottula, Seattle district manager for Soulé for the last 3½ years, will head the new operation.

Atlas Powder promotions

George W. Thompson, who has been manager of Atlas Powder Co.'s

FORNACIARI CO. is now open for business at its new location, 5350 E. Washington Blvd., Los Angeles. The building contains more than 11,000 sq. ft. of floor area.

explosives sales district in Seattle, Wash., since 1948, returns to the company headquarters office in Wilmington, Del., in January to become assistant to W. E. Collins, director of explosives sales. Emmett G. Easterly succeeds Thompson as Seattle district manager, and James M. Ellis from the Portland office is named to the post of Seattle special representative replacing Easterly.

Mortemp names Wheel Industries distributor

Mortemp Heat Machine Co., Seattle, Wash., manufacturer of portable space heaters for the construction industry, has appointed Wheel Industries, Inc., of San Francisco as its exclusive distributor for Northern California and western Nevada.

Yukon Equipment elects new prexy

Yukon Equipment, Inc., Seattle, has announced the election of Everett P. Wood as its president, following the retirement of Stanley B. Tatom. Wood has been associated with the company since its organization in 1945.

Personnel changes at I-H

International Harvester Co. announces the following changes in Western district management. G. B. Healy, assistant manager, Salt Lake City motor truck district office, transferred to Los Angeles in the same capacity. T. L. Davis, assistant manager at the Tulsa motor truck district, transferred to Los Angeles district office as assistant manager, with headquarters at Phoenix, Ariz. P. E. Thomas continues as an assistant manager at Los Angeles. R. C. Battey, assistant manager at Denver motor truck district office, has resigned to enter a Harvester dealership.

Eastling heads Link-Belt in the West

Harvey V. Eastling has been named general manager of Link-Belt Co.'s Pacific Division, with headquarters in San Francisco. He succeeds Ralph M. Hoffman, retiring after forty years' service with the company.

EECO names distributors

Distributor appointments throughout the eleven Western states and Alaska are announced by Eugene Engineering Co., manufacturer of the EECO Rock Drill.

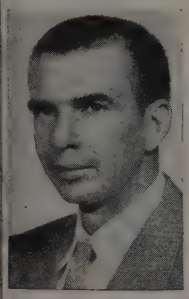
Handling the sales of the tractor-mounted rock drills for their respective areas are: Westmont Tractor & Equipment Co., Missoula and Kalispell, Mont.; Colorado Builders' Supply Co., Denver and Casper, Wyo.; Western Machinery Co., Phoenix; Wheeler-Kershaw Co., Salt

Lake City; Intermountain Equipment Co., Boise and Spokane; Seitz Machinery Co., Inc., Billings and Great Falls, Mont.; R. L. Harrison Co., Albuquerque; Pacific Hoist & Derrick Co., Seattle and Puyallup, Wash.; Northern Commercial Co., Alaska and Yukon; Cascade Equipment Co., Eugene, Ore., and Smith Booth Usher Co., Los Angeles.

Literature of new EECO line of equipment may be obtained from either the distributors or the company headquarters in Eugene.

Galion switches reps. in Southwest territory

Rex F. Price, Galion Iron Works and Manufacturing Co. district representative on motor graders and rollers in the Southwest for the last six years, has been transferred to the

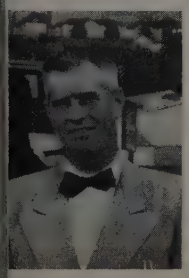


William A. Beale **Southwest district representative for Galion Iron Works and Manufacturing Co.**

Midwest effective January 1st. William A. Beale will take over the vacated territory, representing Galion in California, Arizona, New Mexico, Colorado and Nevada. His headquarters will be in the Los Angeles area.

Goodall elevates Joe Moss

Joe H. Moss, Northwest manager of the Goodall Rubber Co., at Seattle, has been promoted to the post



Joe H. Moss **regional sales director, Goodall Rubber Co.**

of regional sales director according to a recent announcement. His former position will be filled by Herb Cleaver.

National Surety has new Western mgr.

National Surety Corporation announces that as of January 1 Nathaniel P. Gardner, Jr., will be manager of the Pacific Coast Department, making his headquarters at 315 Montgomery St., San Francisco. He will have charge of all the company operations in the states of Arizona, California, Idaho, Montana, Nevada, Oregon, Utah and Washington. Gardner was formerly manager of the surety department at National Surety's home office in New York where he developed a substantial volume of surety business in the construction field.

Casey-Metcalf named Huber distributor

The Huber Manufacturing Co. announces the appointment of Casey-Metcalf Machinery Co., Inc., of Los Angeles as distributor for its complete line of 3-wheel and tandem rollers, the Huber Maintainer and Motor Grader. Casey-Metcalf headquarters are at 5515 E. Slauson Ave., Los Angeles. They will represent Huber in twelve Southern California counties and Clark County, Nev.

Pettibone Wood appoints sales mgr.

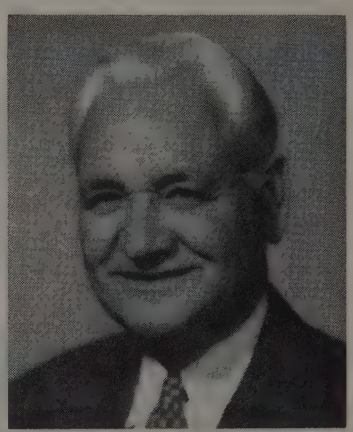
Announcement is made of the appointment of Robert Leibsle as sales manager of Pettibone Wood Mfg. Co., North Hollywood, Calif., recently acquired West Coast subsidiary of Pettibone Mulliken Corp. Leibsle has been associated with the former Wood Manufacturing Co. since 1945, working extensively with highway engineers and road building contractors throughout the United States and abroad.

MANUFACTURERS

Kostyzak named Madsen sales mgr.

Alex Kostyzak, since 1946 general manager and vice president of Smith Booth Usher Co., Los Angeles, has been named sales manager of Madsen Iron Works, Inc., Los Angeles, Calif. He will be in charge of domestic and foreign sales of Madsen asphalt paving plants and other Madsen construction equipment items.

Alex Kostyzak is well known in the construction industry, having held virtually every type of construction job from clerk, laborer, dragline operator to foreman and superintendent in various parts of the U. S. as well as in several foreign countries. Kostyzak permanently moved to California in 1936 and went to work for Smith Booth Usher as a salesman. In 1945 he was promoted to sales manager and one year later was made general sales manager and vice president. He remained with Smith Booth Usher until the firm was sold in January of 1953.



Alex Kostyzak

He has served as president of the Equipment Distributors and Manufacturers of Southern California; director of the Southern California Chapter of Associated Contractors of America, and as a member of various committees of the Associated Equipment Distributors of America. At the present time he is a member of the executive committee of the Southern California Chapter of the American Public Works Association.

Marlow merges with Bell & Gossett

Marlow Pumps, manufacturer of self-priming centrifugal pumps, merged with the Bell & Gossett Co., manufacturers of pumps and other heating specialties, as of December 1st, according to A. S. Marlow, Jr., president of the firm. Both product lines will retain their individual identity through sales, marketing and distribution. Under the new setup, Marlow Pumps will be known as the Marlow Division of Bell & Gossett and will be headed by A. S. Marlow, Jr., as general manager.

Milligan named American Tractor veep

Dave Milligan, sales manager of Harry Ferguson, Inc., has been appointed vice president in charge of sales of the American Tractor Corp. He will assume responsibility for increased distribution and sales and will assist in the development and coordination of specialized equipment.

Clayton splits sales areas

Clayton Manufacturing Company of El Monte, Calif., is expanding distribution and the development of new markets for the Clayton package-type steam generator. J. J. Billman, formerly sales manager of the steam generator division, has become Western sales manager. H. M. Kirkby, formerly sales promotion manager, took over sales direction for the Eastern division, operatng out of the company's Chicago office.

Ulrich names consultant

O. Q. Hinds, motor grader consultant with the Caterpillar Tractor Co., has joined the Ulrich Products Corp. as a general consultant. Ulrich manufactures Domor attachments for Caterpillar equipment.

Zucco returns from military leave

Gaetan M. Zucco has returned from military service leave to resume his duties as contracting manager, Fabricated Steel Construction, Los Angeles district, Bethlehem Pacific Coast Steel Corp.

Thew promotes two

R. G. Thibaut, assistant service manager of the Thew Shovel Co., has been appointed service manager in place of R. P. Kelly, who died recently. C. W. Raby, manager of field service, becomes assistant service manager in place of Thibaut.

R. G. Thibaut
new service manager, Thew Shovel Co.

American Hoist elects Carroll

John E. Carroll, former vice president of sales, was elected president of American Hoist & Derrick Co., succeeding Harold O. Washburn, who becomes Chairman of the Board. Washburn had served as president

ARCHITECT'S DRAWING of Hyster Co.'s new quarters at 2425 So. Garfield Ave., Los Angeles. The building has 14,451 sq. ft. of floor space.

since 1945. Carroll joined American Hoist in 1937. He was salesman for the Western district for a while, later leaving the company to become a partner in the firm of Harron, Rickard & McCone Co., heading the construction equipment division. In 1949 he returned to American Hoist as general sales manager.

Porter acquires Alloy Metal Wire

H. K. Porter Co., Inc., has acquired Alloy Metal Wire Co., producer of stainless and alloy steel wire, rod and strip used principally in the electrical, electronic and chemical fields. Operations will continue as The Alloy Metal Wire Co., Division of H. K. Porter Co., Inc.

LeRoi names sales rep.

Paul D. Sullivan, a specialist on heavy construction sales, has been named manager of contractor sales for the construction and mining division of LeRoi Co., with responsibility for sales to large contractors throughout the United States.

Allis-Chalmers ups Pohl

Promotion of Neil Pohl to the newly created position of motor grader sales manager, industrial sales department of the Tractor Division, Allis-Chalmers Manufacturing Co., is announced by A. E. Dorn, industrial sales manager.

Euclid sales appointments

The following promotions in the sales organization of Euclid Road Machinery Co. are announced: V. L. Snow, formerly manager, domestic sales, is promoted to the position of director of sales, succeeding E. F. Armington, who is leaving active service but will serve as a sales consultant. J. E. Ehlert steps into the vacancy left by Snow's promotion. P. I. Malenchini and R. W. Phillips continue to direct export sales and defense requirements respectively.

Also recently announced is the appointment of Robert J. Lenz as manager of the customer service department, succeeding George M. Perry who was made director and works manager of Euclid Great Britain, Ltd.

Charles Ball dies

Charles D. Ball, Jr., long-time employee of the United States Spring & Bumper Co., died in San Francisco, Oct. 31. He had been Highway Guard sales manager for the company for 25 years and was well known throughout the West.

Continued on page 154

Here's how to . . .

DOUBLE the HOURS of SERVICE of your OFF-HIGHWAY TIRES!

. . . at far lower cost than new tires!

RE-CAPPING EXPERT . . .

Marvin Doepner, above, is a specialist in off-the-road tires — new and re-capped. He is at your service, in the field, throughout the eleven Western states! Ask Wheeler to send Mr. Doepner to your job.

KRAFT SYSTEM RECAPPING
A GENERAL TIRE SERVICE

You save at least 50% of cost of new tires . . . and get equal hours of ADDITIONAL SERVICE . . . Order the HAWKINSON system of tire re-treading through WHEELER'S, at Salt Lake City.

We *guarantee* to produce as many hours of service on your heavy-duty, off-highway tires as original tread hours!

Attractive discounts! Price quotations on request. Save time (our plant operates 24 hours a day). Save freight (we're centrally located to the 11 Western states.

Wire, write or phone. Let us prove big savings to you!

SECTIONS AND RECAPPING SIZES

1200 x 24
1300 x 24 (grader)
1400 x 24
1800 x 24
1800 x 25
2100 x 24
2100 x 25
2400 x 24
2400 x 25
2400 x 29

WHEELER'S

For Finest Recapping of Off-Highway Tires!

Distributor of General Tires

AT SALT LAKE CITY

Wheeler General Tire Co. — 1388 South 2nd West — Phone: 6-8646

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.

POSITIONS AVAILABLE

DISTRIBUTORS WANTED...

We are looking for distribution in handling a new powder-actuated Stud Driver, and complete line of all studs & charges on an exclusive basis in your trading area.

The studs and charges are interchangeable with competitive makes, which makes an owner of any powder actuated gun a prospective customer.

This is a highly profitable line and could be added as an extra department with one or two salesmen selling this line exclusively or fitted right in with your present organization calling on all trades of contractors.

For further information write or call

The Mantz Company
351 South Atlantic Boulevard
Los Angeles 22, California
ANgelus 9-7417

GOT THE MAKINGS OF AN EDITOR?

- Here's a beginning job on a construction engineering magazine with a good future for a man in his twenties who is willing to learn.
- Some engineering training or construction experience desirable. Ability or background in journalism helpful.
- The job includes travel with expenses paid. Headquarters on Pacific Coast. Salary open.

Write Box 1201

WESTERN CONSTRUCTION
609 MISSION STREET
SAN FRANCISCO 5, CALIF.

OVERSEAS

Spain — No. Africa — So. America — Asia
A digest guide to who & where are the most active constructors recruiting men and women for airbase, military & UN & private projects outside U. S. Send $1.
COVE-McKANE INTERNATIONAL
P. O. Box 126 New York 4, N. Y.

SUPPLIERS OF CONTRACTOR & LOGGING RIGGING

WIRE ROPE
Splicing and Socketing

- Custom Lifting Devices
- Arch Lines
- Chokers
- All Styles Wire Rope Slings
- Lowery's Safety Cartow

BEacon 8383

LOWERY BROTHERS
WIRE ROPE SPLICING SERVICE
1925 N.W. 22nd Avenue — Portland, Oregon — BEacon 8383

OFFICIAL PROPOSALS

ADVERTISEMENT

Sealed bids will be received in the office of the Engineering and Construction Director, Panama Canal Company, Balboa Heights, Canal Zone, until 10:00 AM E.S.T., January 27, 1954 at which time they will be formally opened, for preparation of site, clearing and grubbing, excavation, demolition, fills, backfills; installation of sanitary and storm sewers including structures, service lines and house connections, electrical distribution service conduits and conductors; construction of street pavements, curbs, and gutters, driveway and walk; construction of 63 houses complete. Project to be completed 300 calendar days after award. Plans and specifications may be obtained from Panama Canal Company, 24 State St., New York 4, N. Y. Requests should be accompanied by a $40.00 deposit for each set. Deposit should be made payable to "Treasurer, Panama Canal Company." Plans and specifications may be inspected at the following places:

Panama Canal Company
101 Indiana Ave., N. W.
Washington 25, D. C.

Panama Canal Company
24 State Street
New York 4, N. Y.

Office of the District Engineer
U. S. Engineer's Office
1709 Jackson Street
Omaha 2, Nebraska

Office of the District Engineer
U. S. Engineer's Office
180 New Montgomery Street
San Francisco 19, California

Office of the District Engineer
U. S. Engineer's Office
P. O. Box 1538
Albuquerque, New Mexico

Office of the District Engineer
U. S. Engineer's Office
751 S. Figueroa Street
Los Angeles, California

Office of the Division Engineer
U. S. Engineer's Office
Southwestern Division
1114 Commerce Street
Dallas, Texas

Office of the District Engineer
U. S. Engineer's Office
4735 Marginal Way
Seattle 4, Washington

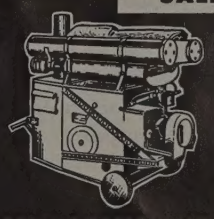
Office of the District Engineer
U. S. Engineer's Office
Foot of Prytania Street
New Orleans, Louisiana

ENGINEERS — FOREMEN — OFFICE MEN
Learn latest methods to organize and run work. Prepare for the top jobs. Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

DIAMOND DRILLS

SELL OR RENT
Surface and Underground Used Machines With Complete Operating Equipment.
For Sale at about one-half new price.
For Rent at about 10% per month of new price.
For further information write
HAVLICK DIAMOND DRILLING CO., INC.
2703 No. Pittsburg St., Spokane 26, Wash.

HEAT — PORTABLE HEATER SALE!



108 FEET OF DUCTS INCLUDED!

250,000 B.T.U. PORTABLE HEATER & DRYER

SALE PRICE $199

Herman Nelson portable, powerful 250,000 B.T.U. gasoline or oil burning heaters with turbine-type blowers. 1½ h.p. air-cooled, ball bearing engine. 108 ft. of flexible, flameproof, waterproof ducts.

HEATING buildings under construction, shops, sheds, warehouses, barns, tunnels, hangars, spot-heating, etc.

DRYING concrete, plaster, mortar, paint, etc. Torrid blasts of heat.

PRE-HEATING engines, tractors, trucks, freight cars, equipment.

THAWING machinery, freight cars, tanks, pipelines, frozen areas, etc.

IMMEDIATE DELIVERY • SATISFACTION GUARANTEED OR PURCHASE PRICE REFUNDED!

WIRE OR PHONE COLLECT
Your Heater can be shipped within 1 hour.

BERNSTEIN BROS.
Since 1890
References: Dun & Bradstreet, Pueblo Savings & Trust Co.
175-1511 So. Santa Fe Phone 11704 Pueblo, Colo

MANUFACTURERS

. . . Continued from page 151

U. S. Rubber personnel changes

J. J. Davison has been named manager of truck tire sales for the Fisk-Gillette tires division of United States Rubber Co., according to a recent announcement by John A. Boll, division sales manager. A. G. Richtmyer has been appointed district manager at Portland, Ore., and R. P. Buis takes over Richtmyer's former responsibilities at Kansas City.

Aeroquip news

The appointment of Matthew J. Betley as vice president and general manager of Aeroquip Corporation, a leading manufacturer of flexible hose lines and hydraulic fittings, was recently announced by Peter F. Hurst, president.

Pohndorf now National sales mgr.

Henry L. (Hank) Pohndorf, chief engineer of the National Welding Equipment Co. of San Francisco has been elevated to the position of sales manager, according to a recent announcement by George Hammon, vice president and general manager. Along with his new responsibilities, Pohndorf will retain the position of chief engineer, a position he has held since joining the National staff.

Flexible Steel elects officers

Milton B. Beach has been elected president and general manager of Flexible Steel Lacing Co., manufacturers of belt fasteners for joining conveyor and transmission belting. John P. Ramsey becomes vice president and sales manager. Philip Rinaldo and Hugh L. Coats continue as treasurer and secretary, respectively.

CORRECTION

The names of two P&H dealers were omitted from the Harnischfeger Corporation advertisement on pages 42 and 43 of this issue. They are:

Liberty Trucks and Parts Co., 690 Lincoln Street, Denver, Colorado, and Leonard Motor Co., 1211 North 4th Street, Albuquerque, New Mexico.

ADDITIONAL CLASSIFIED

ADVERTISERS in this issue

BACKFILL, uncompacted

Liquor smuggling in Saudi Arabia—the inside story

We see by the papers that things are getting tougher for construction men in Saudi Arabia. Moslem law is dead set against alcohol, and the country has recently been clamping down on its use, which is mainly by foreigners. Even rubbing alcohol in hospitals has been suspect. The climax came late last year when three construction men were deported on an alcohol smuggling charge. It seems they had been on "vacation" across the border, had tanked up a bit, and returned to Saudi Arabia with liquor on their breath. According to the Construction Men's Association, the official charge had it that the men were guilty of transporting liquor into the country in their stomachs!

They're either too many or too few

The West is a region of contrasts. We've mentioned climate, elevation, topography, etc. Here's a new one. In a month that saw 16 contractors bid on $58,600 of highway work (one contract) in Utah, the State of New Mexico had a bid opening for construction of a sewage disposal plant at the New Mexico Industrial School.

There were no bids at all.

Now it's GMC silent power for the public benefit

General Motors announces that a new design of exhaust muffler is being made standard equipment on GMC trucks. Specially named "silent power" as a reminder that no engine power has been sacrificed, the muffler-and-pipe system was engineered cooperatively by GMC engineers and muffler manufacturers.

Different models have been developed to suit both gasoline and diesel trucks. The equipment is generally described as a reverse-flow type of muffler, larger than before, and built of heavier gauge metal. Exhaust manifolds are new also, and the system uses a larger exhaust pipe.

This kind of attention to detail is a good move, and we're glad to see GMC throw the design out for copying, so that other manufacturers can use it and all truck operators benefit. Noise has been one of the big public relations problems of trucking people.

Even so, progress always calls for mixed emotions. When the diesel locomotive and its air horn supplanted the shriek and wail of the steam locomotive, a generation of youngsters turned to the snort and growl of the big rigs of trucking and construction. If "silent power" quiets a construction job to the noise level of a tea shoppe, the kids will have to look further still.

Twenty-five years ago in *Western Construction*

"Foundation excavation has commenced for **Stewart Mountain Dam,** for the Salt River Valley Water Users Association, Arizona. Diamond-drilling at the dam site has been completed, a 30-house camp has been built, and about 200 men are employed."

* * *

"The federal government has alloted $73,125,000 for federal-aid highway construction during the fiscal year beginning July 1, 1929." Total for the eleven Western states was $13,496,200.

* * *

"A new excavator of 3½-cu. yd. capacity has been added to the line of gasoline, diesel, and electric powered shovels, draglines, and crawler cranes manufactured by **Harnischfeger Corporation.** It is known as the Model 900."

* * *

"**Utah Construction Co.** will complete their contract during July 1929 for construction of the Klamath Falls-Alturas extension for the Southern Pacific Co. Major items of equipment being used: one P&H dragline, two Erie draglines, two Northwest draglines, three Bucyrus draglines, two Erie shovels, two Bucyrus shovels, one Osgood shovel, two Marion shovels, 14 Ingersoll-Rand portable compressors, two dinkey locomotives, 30 4-yd. Western cars, 40 trucks (2- to 10-ton capacity), various tractors, teams, and miscellaneous equipment."

* * *

"The **Coos Bay** jetty project, opening a harbor for coastal, intercoastal, and some foreign ships, the largest port between San Francisco and the Columbia River, is nearing completion."

* * *

"When bids were recently opened by the Board of Public Works of San Francisco, . . . **J. P. Holland** submitted a bid of $103,520 and **Meyer Brothers** $108,373—as against the city engineer's estimate of $190,000. The question arises, is the contractor $86,500 right or wrong?"

He's either too high or too low

George Miller, a Reno contractor, was a little high on one of his bids last year. We're thinking of the Sierra County job in California for which Miller brought in his bid by airplane at the last minute, dropping the envelope near the courthouse just in time. As reported on this page in September, the bid was too high even after it landed, and Miller missed out on the job. But he got another one later on.

He bid on some sewer system work in Sparks, Nevada, including nine manholes. When the bids were opened, unit prices ranged from $2.36 to about $300 on each installation. Miller tried to dust the flyspecks off his low bid, but when it turned out they were really decimal points, he swallowed hard once or twice and then announced he'd take the job anyhow. Even, you might say, if it meant going into the hole—nine times!

It's a long cold winter?

A man in Idaho, of all places, is looking hopefully for an extremely cold winter. Walter Friberg is with the University of Idaho, at Moscow, and needs the weather for testing purposes. It seems he has been working on sawdust-shavings concrete and is curious to observe effects of low temperatures on some of his test structures. He shouldn't be too disappointed.

It's a long cold winter!

From Salt Lake City comes word that the U. S. Court of Claims has just awarded a $572,838 judgment to Warner Construction Co. of Chicago for losses suffered on a Colorado-Big Thompson project contract. Original bid on the work was about $4,227,000, but change orders added almost $1,000,000 more. The court conclusion was that Warner was also entitled to the judgment as a result of strikes and other construction difficulties . . . brought on by World War II!

The contract was for construction of Green Mountain Dam, begun in 1938, completed in June 1943!

. . . The Editors