

1400 WESTERN AVENUE

CORNELL
HOWLAND
HAYES &
MERRYFIELD
CONSULTING ENGINEERS

1955

CORNELL, HOWLAND, HAYES & MERRYFIELD

CONSULTING ENGINEERS



CORNELL, HOWLAND, HAYES & MERRYFIELD


Consulting Engineers

1600 WESTERN AVENUE
IDAHO BUILDING

CORVALLIS, OREGON
BOISE, IDAHO

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TELEPHONE 3-5221

THE COVER
MAIN ENTRANCE TO OFFICE
CORVALLIS, OREGON



Cornell, Howland, Hayes and Merryfield, a professional partnership, offers a complete engineering service in the civil, electrical, mechanical, and chemical fields. The work done by this firm includes:

Analysis and design of

**PROCESSES AND PLANTS
STRUCTURES AND FOUNDATIONS
WATER, GAS AND SEWER SYSTEMS
ELECTRIC POWER SYSTEMS AND STATIONS
ELECTRIC AND ELECTRONIC CONTROLS
POWER PLANTS**

Supplementary services, such as

**ECONOMIC INVESTIGATIONS AND REPORTS
PREPARATION OF OPERATION MANUALS
SPECIFICATION WRITING
RATE INVESTIGATIONS
AREA PLANNING
VALUATIONS
ESTIMATING
INSPECTION
RESEARCH
TESTING**

Holly A. Cornell
James C. Howland

Thomas B. Hayes
Fred Merryfield

Archie H. Rice
Ralph E. Roderick



HOLLY A. CORNELL

B.S., Oregon State College
M.S., Yale University

Partner



JAMES C. HOWLAND

B.S., Oregon State College
S.M., Mass. Institute of
Technology

Partner



THOMAS BURKE HAYES

B.S., Oregon State College
S.M., Mass. Institute of
Technology

Partner



FRED MERRYFIELD

B.S., Oregon State College
M.S., University of N. Carolina

Partner

CORNELL, HOWLAND, HAYES AND MERRYFIELD (CH₂M) was formed as a professional partnership in Corvallis, Oregon, after World War II for the practice of civil, mechanical, and electrical engineering. In 1947, Archie Rice and Ralph Roderick became partners.

The organization has its main office in Corvallis, Oregon, and a branch office in Boise, Idaho, where Earl C. Reynolds, Jr., is the engineer in charge. Projects designed by the firm are located throughout the Northwest. Clients have included municipal, county, state, and federal agencies as well as private industry.

CH₂M personnel are trained to handle engineering problems from the research and planning stage through to the finished project. The firm is made up of closely coordinated departments whose operations are supervised by the partner in charge of each project. The staff includes registered, graduate sanitary, structural, mechanical and electrical engineers, resident engineers, surveyors, draftsmen, stenographers, and clerical help.



Many of the projects are in the utility fields. Water-system projects have included dams, reservoirs, pipe lines, pumping stations, and water-treatment plants. Sewer-system designs have often called for pumping stations as well as treatment plants. Power designs have been developed for hydroelectric generating stations, steam generating stations, substations, and distribution systems. In addition, these utility developments often require access roads and railroad spurs.

The firm also has designed industrial plants and processes, industrial structures, military installations, and recreation facilities. It offers a wide array of supporting services to industry, architects and municipalities, such as heating, ventilating, air conditioning; power, lighting, and structural design; research and development; appraisals, rate studies, and technical investigations.

Through a wholly owned subsidiary, General Services Company, Cornell, Howland, Hayes and Merryfield offers services in such allied fields as test-hole drilling, soil sampling, and special-equipment development and assembly.

A general view of the Corvallis drafting room.

ARCHIE H. RICE

B.S., Oregon State College
Partner



RALPH E. RODERICK

B.S., Kansas State College
Partner



EARL C. REYNOLDS, JR.

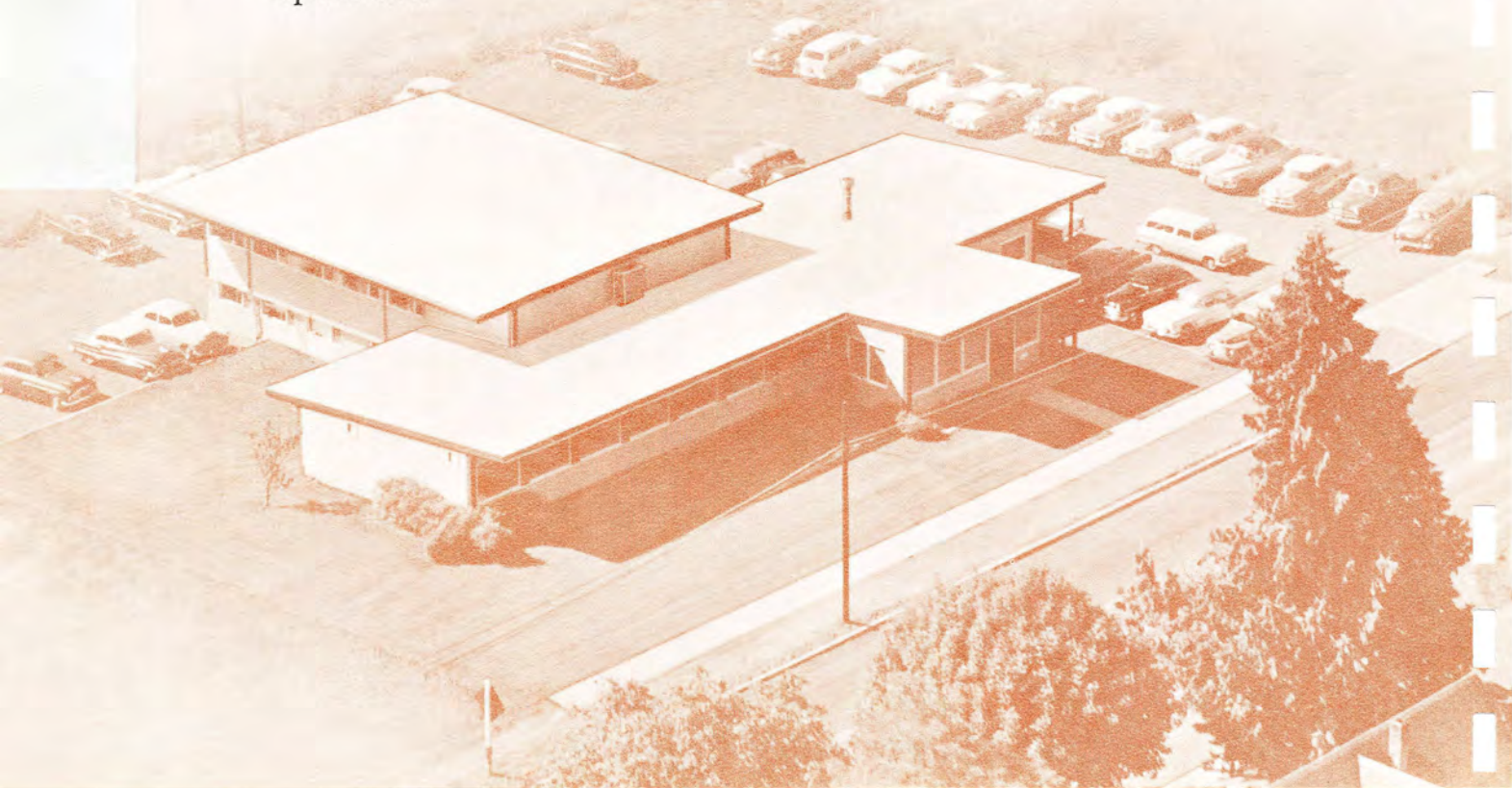
B.S., Oregon State College
M.S., Yale University
*Engineer in Charge,
Boise Office*





The Corvallis facilities include a modern, well-lighted office designed to provide pleasant, efficient working conditions for the technical staff. Ample off-street parking is available for staff and visitors. Equipment includes surveying instruments, concrete-testing apparatus, electric power indicating and recording instruments, heating and ventilating testing instruments and devices, recording water-level and pressure gauges, as well as duplicating machines and a fleet of vehicles for transporting personnel and equipment. The firm has an ample engineering library, and also is located near the Oregon State College campus where an outstanding technical library, research laboratories, and consulting specialists in many fields are available.

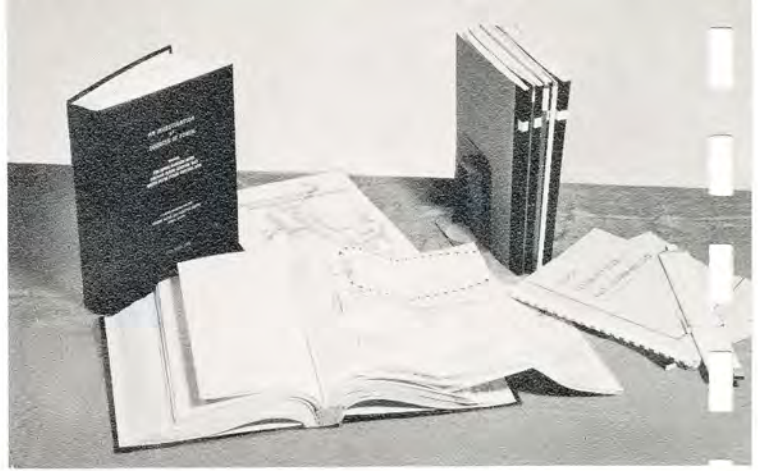
From the Idaho capital city, the well-equipped Boise office effectively serves the State of Idaho, the Snake River Basin, and the intermountain area. The entire staff and facilities of the Corvallis office are constantly available to support the Boise operations.



TYPICAL PROJECTS



INVESTIGATIONS AND REPORTS



An engineering investigation is the essential first step in developing a project for any client, for out of this preliminary study are evolved the basic concepts to be followed. Whether the project is extensive or not, the preliminary investigation must be thorough and painstaking if the completed project is to be economical, dependable, efficient, and profitable.

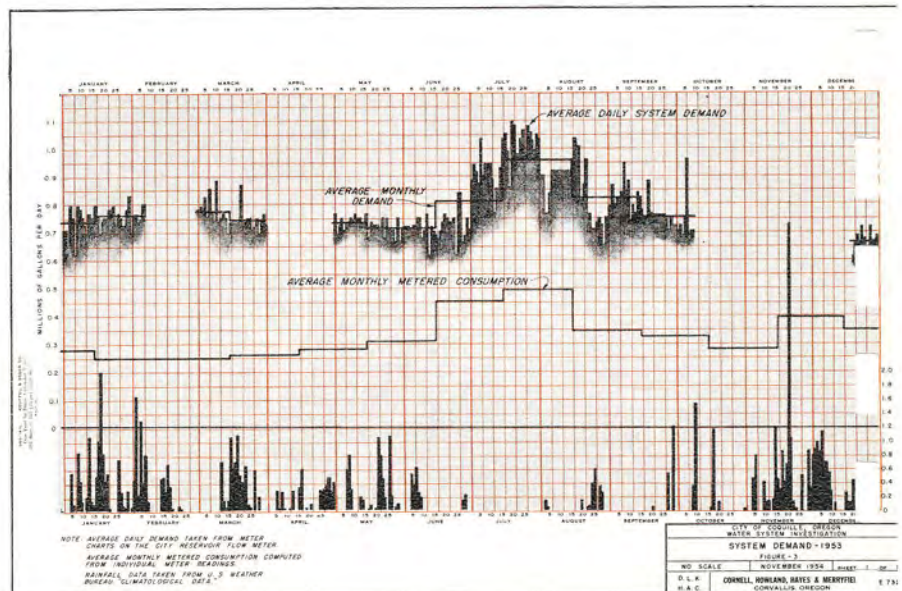
For these reasons, Cornell, Howland, Hayes and Merryfield places great importance on the study phase of a project and has developed a reputation for producing preliminary reports which are adequate in scope and complete in detail. Particular emphasis is given to economic feasibility and to plans for financing the project.

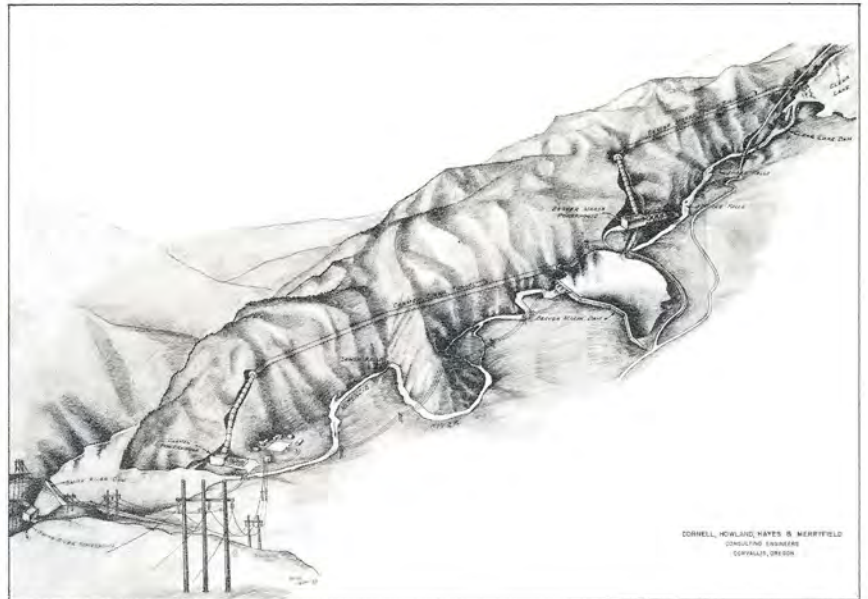
In a preliminary investigation, basic data are gathered and reported in easily understandable graphs and tables. Preliminary plans are clearly presented by means of drawings and maps. The financial program is outlined in concise tabulations, and the report is carefully reviewed with the persons concerned.

Preliminary investigations have been completed in a wide variety of fields, examples of which are:

Power potential of the McKenzie and Santiam Rivers for the Eugene, Oregon, Water and Electric Board;

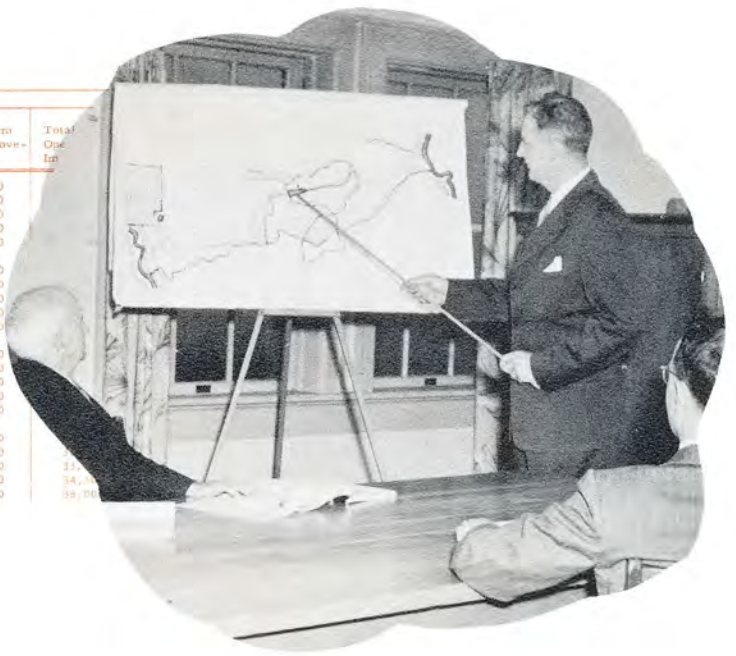
Industrial water supply and waste disposal for the Georgia-Pacific Corporation at Toledo, Oregon;





- Water supply and distribution for Walla Walla, Washington;
- Sanitary study of Lane County Metropolitan area for Eugene and Springfield, Oregon;
- Industrial area development for the Port of Portland;
- Utilization of lumber-mill waste for process-steam and electric-power production for the Elk Lumber Company, Medford, Oregon;
- Development plan for Winchester Bay commercial fishing and recreation project;
- Investigation of smelter size and design for the National Metallurgical Corporation, Springfield, Oregon;
- Study of the electrical, water, and sewer systems for Mountain Home Air Force Base;
- Process and preliminary wax-extraction plant design for Rounds and Conklin;
- Combined water, sanitary-sewer, and storm-sewer master plans for Pasco, Washington;
- Master plan for water distribution system for the Boise Water Corporation;
- Sanitary-sewer system and sewage-treatment plan for Idaho Falls, Idaho.

| Year-Ending July 1 | No. of Water Services | Bonds Outstanding | DISBURSEMENTS | | | | | | | | Total Op. Exp. |
|--------------------|-----------------------|-------------------|---------------|-----------------|--------------------|-----------------|----------------|-----------------|------------------------|--------------------|----------------|
| | | | DEBT SERVICE | | | WATER SUPPLY | | | | | |
| | | | Bonds Retired | Interest at 4 % | Total Debt Service | Water Purchased | Well Operation | Treatment Plant | Water System Operation | System Improvement | |
| 1955 | 458 | 150,000 | --- | 6,000 | 6,000 | 5,500 | 4,700 | 900 | 10,900 | 3,000 | 2,000 |
| 1956 | 476 | 146,000 | 4,000 | 6,300 | 10,300 | 5,700 | 1,100 | 3,400 | 10,900 | 2,000 | 2,000 |
| 1957 | 486 | 141,000 | 5,000 | 5,840 | 10,840 | 5,900 | 1,100 | 4,100 | 10,900 | 2,000 | 2,000 |
| 1958 | 492 | 136,000 | 5,000 | 5,640 | 10,640 | 5,100 | 1,100 | 3,500 | 11,200 | 2,000 | 2,000 |
| 1959 | 500 | 130,000 | 6,000 | 5,440 | 10,440 | 5,300 | 1,100 | 3,600 | 11,500 | 2,000 | 2,000 |
| 1960 | 510 | 124,000 | 6,000 | 5,200 | 11,200 | 6,500 | 1,100 | 4,800 | 11,800 | 2,000 | 2,000 |
| 1961 | 520 | 118,000 | 6,000 | 1,950 | 10,950 | 6,700 | 1,100 | 4,000 | 12,100 | 2,000 | 2,000 |
| 1962 | 536 | 111,000 | 7,000 | 1,720 | 11,720 | 6,900 | 1,100 | 4,200 | 12,500 | 2,000 | 2,000 |
| 1963 | 546 | 104,000 | 7,000 | 4,440 | 11,440 | 7,100 | 1,100 | 4,400 | 12,700 | 2,000 | 2,000 |
| 1964 | 550 | 97,000 | 7,000 | 4,160 | 11,160 | 7,300 | 1,100 | 4,100 | 13,000 | 2,000 | 2,000 |
| 1965 | 560 | 89,000 | 8,000 | 1,880 | 11,880 | 7,500 | 1,100 | 4,800 | 13,300 | 2,000 | 2,000 |
| 1966 | 570 | 81,000 | 8,000 | 1,560 | 11,560 | 7,700 | 1,100 | 5,000 | 13,600 | 2,000 | 2,000 |
| 1967 | 580 | 73,000 | 9,000 | 1,240 | 11,240 | 7,900 | 1,100 | 5,200 | 13,900 | 2,000 | 2,000 |
| 1968 | 590 | 65,000 | 9,000 | 2,880 | 11,880 | 8,100 | 1,100 | 5,400 | 14,200 | 2,000 | 2,000 |
| 1969 | 600 | 57,000 | 9,000 | 2,520 | 11,520 | 8,300 | 1,100 | 5,600 | 14,500 | 2,000 | 2,000 |
| 1970 | 610 | 44,000 | 10,000 | 2,160 | 12,160 | 8,500 | 1,100 | 5,800 | 14,800 | 2,000 | 2,000 |
| 1971 | 620 | 34,000 | 10,000 | 1,760 | 11,760 | 8,700 | 1,100 | 6,000 | 15,100 | 2,000 | 2,000 |
| 1972 | 630 | 23,000 | 11,000 | 1,360 | 12,360 | 8,900 | 1,100 | 6,200 | 15,400 | 2,000 | 2,000 |
| 1973 | 640 | 12,000 | 11,000 | 920 | 11,920 | 9,100 | 1,100 | 6,400 | 15,700 | 2,000 | 2,000 |
| 1974 | 650 | 12,000 | 12,000 | 480 | 12,480 | 9,300 | 1,100 | 6,600 | 16,000 | 2,000 | 2,000 |



Notes:
 Table based on selling bonds July 1, 1954.
 Water treatment plant operates only two months first year.
 After first year railroad well steadily and railroad service only.
 Treatment plant operates May through September.
 Winter water purchased from Deschutes Valley Water District.

WATER

- SUPPLY
- STORAGE
- TREATMENT
- DISTRIBUTION

Water, our most important natural resource, plays a vital part in the development of industries and communities. The planning and design of facilities to provide water of the quality and in the quantity needed is one of the principal activities of this firm.



Pipe gallery, water-treatment plant, Forest Grove, Oregon.



Installing water supply line across the Umatilla River. A successful river crossing must be skillfully planned and constructed under careful supervision.

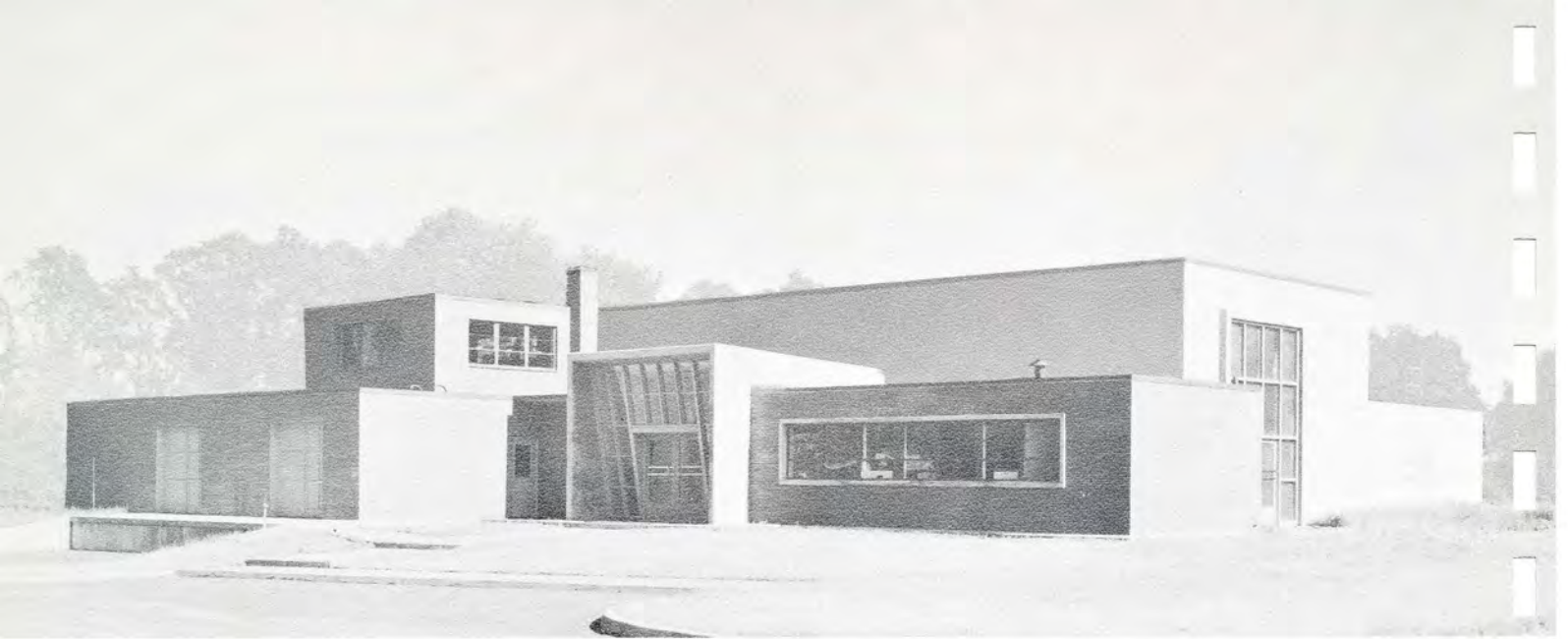


Madras, Oregon, now has a modern 600,000-gallons-per-day water-treatment plant. Special problems resulting from severe climatic conditions and raw water of poor quality were solved.

General view of the closely integrated water-storage and treatment-plant facilities at Newport, Oregon. Plant capacity is 1.5 million gallons per day.



This compact, semi-automatic plant supplies 500,000 gallons of water a day for Florence, Oregon. The single location for reservoir and plant virtually eliminates clearwell cost.



This plant, located on the Willamette River, supplies part of the water needs for Corvallis, Oregon. It has a capacity of 4 million gallons per day.



Pump room of the Corvallis Willamette River Plant. Plant design provides for economical expansion in increments to 16 million gallons per day. On its gravity supply system, Corvallis also has a treatment plant designed by this firm, with a capacity of 4 million gallons per day.



One-million-gallon prestressed-concrete reservoir under construction in Englewood Heights, Yakima, Wash.

2.3-million-gallon reservoir and chemical-feed building at Cottage Grove, Oregon.



This pumping station at Nyssa, Oregon, is located over the caisson of a horizontal water collector having a capacity of 2.8 million gallons per day.

Coquille, Oregon, is served by this 1.5-million-gallons-per-day plant. Its hilltop location provides gravity feed to the city water system.



WATER SYSTEM PROJECTS



The Georgia-Pacific Company at Toledo, Oregon, receives its water from a combination of sources. Olallie Creek, the primary source, is supplemented by water pumped into the Olallie basin from the Siletz River seven miles away. An earthfill storage dam is also provided in the Olallie watershed. Near the mill, the water is pumped from behind the salt-water barrier at tidewater shown in the construction photo above.

Industrial Water is in growing demand. Cornell, Howland, Hayes and Merryfield has served many of the Northwest industries in developing their supply. All possible sources of water and their costs are thoroughly studied in working out the development plan.

SUPPLY

Athena, Oregon
Bandon, Oregon
Bingen, Washington
Boise Water Corporation
Buxton, Oregon
Canby, Oregon
Canyonville, Oregon
Caulkins Road Water District
College Crest Water District
College Place, Washington
Cottage Grove, Oregon
Corvallis, Oregon
Coquille, Oregon
Crystal Springs Water Company
Creswell, Oregon
Dallas, Oregon
Deschutes Valley Water District
Depoe Bay Water District
Drain, Oregon
Elk City Water District
Fairview Water District
Fir Manufacturing Company,
Myrtle Creek, Oregon
Florence, Oregon
Forest Grove, Oregon
Georgia-Pacific Paper Company
Gladstone, Oregon
Glenns Ferry, Idaho
Gold Hill, Oregon
Heyburn, Idaho
Highlands, Inc., Boise, Idaho
Hood River, Oregon
Jacksonville, Oregon
Junction City, Oregon
Kennewick, Washington
Kenwood Water District
Langlois, Oregon
Lyons Water District
Madras, Oregon
Menasha Plywood Corporation
Midway Water District
Milton-Freewater, Oregon
Myrtle Creek, Oregon
Newport, Oregon
Nyssa, Oregon
Oregon Lumber Company
Pacific Power and Light Company
Parkrose Water District
Pasco, Washington
Pendleton, Oregon
Philomath, Oregon
Pope & Talbot Lumber Company
Redmond, Oregon
Reedsport, Oregon
Riddle, Oregon
Roberts Creek Water District
Santa Clara Water District
Sheridan, Oregon
St. Helens, Oregon
Sublimity, Oregon

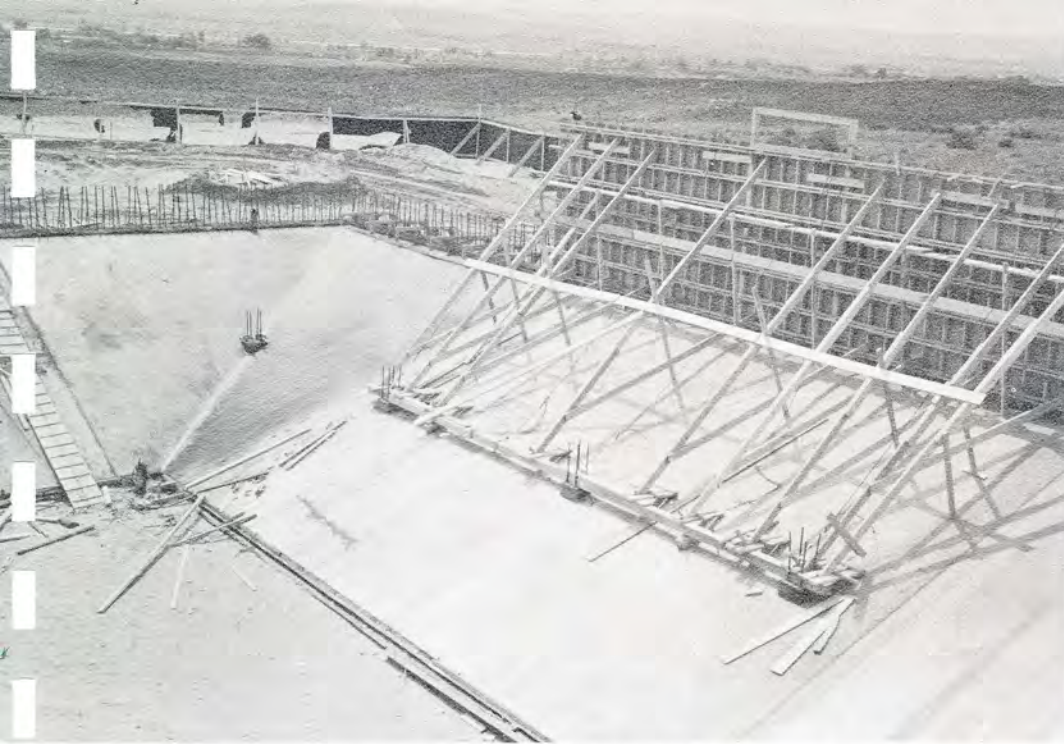
Toledo, Oregon
Tri-City Water District
Umatilla, Oregon
Wah Chang Corporation
Walla Walla, Washington
Wallula, Washington
Warden, Washington
Weiser, Idaho
Western Kraft Corp.
Weston, Oregon
Winston-Dillard Water District
Willamette Valley Lumber Co.
Yakima, Washington
Yoncalla, Oregon

DISTRIBUTION

Athena, Oregon
Bandon, Oregon
Bingen, Washington
Boise Water Corporation
Brownsville, Oregon
Canyonville, Oregon
Corvallis, Oregon
Cottage Grove, Oregon
Dallas, Oregon
Deschutes Valley Water District
Eugene Water and Electric Board
Florence, Oregon
Gilbert Water District
Glenns Ferry, Idaho
Heyburn, Idaho
Highlands, Inc., Boise, Idaho
Hood River, Oregon
Jacksonville, Oregon
Jantzen Beach Park
Lyons Water District
Medford, Oregon
Madras, Oregon
Midway Water District
Myrtle Creek, Oregon
Nyssa, Oregon
Parkrose Water District
Pasco, Washington
Pendleton, Oregon
Riddle, Oregon
Salem, Oregon
Salem College and Academy
Santa Clara Water District
Skyline Park Addition
St. Paul, Oregon
Springfield, Oregon
Sublimity, Oregon
Three Rocks, Oregon
Tri-City Water District
Umatilla, Oregon
U. S. Army, Corps of Engineers
U. S. Navy, Bureau of Yards & Dock
Walla Walla, Washington
Warden, Washington
Weiser, Idaho
Weston, Oregon
Yakima, Washington

Shown below are the 2-million-gallons-per-day water-treatment plant and the 5-million-gallon reservoir at Forest Grove, Oregon.





Five-million-gallon covered reservoir under construction at Pasco, Wash.

CH₂M has analyzed numerous hydraulic networks using the Hardy Cross Method of Analysis of Flow in Networks of Conduits or Conductors. More recently, the firm has employed the analog and digital computer techniques in these studies.

This wide experience with both methods of analysis enables the firm to employ the techniques best suited to solve water distribution problems accurately and economically.

RESERVOIRS

Bingen, Washington
 Boise Water Corporation
 Brownsville, Oregon
 Cottage Grove, Oregon
 Coquille, Oregon
 Dallas, Oregon
 Deschutes Valley Water District
 Eugene Water and Electric Board
 Florence, Oregon
 Forest Grove, Oregon
 Hood River, Oregon
 Madras, Oregon
 Pasco, Washington
 Parkrose Water District
 Rainier, Oregon
 Sheridan, Oregon
 Sublimity, Oregon
 Umatilla, Oregon
 U. S. Army, Corps of Engineers
 U. S. Navy, Bureau of Yards & Docks
 Winston-Dillard Water District
 Yakima, Washington

Repairing existing reservoirs at Dallas, Oregon.



TREATMENT PLANTS

Corvallis, Oregon
 Coquille, Oregon
 Eugene Water and Electric Board
 Florence, Oregon
 Forest Grove, Oregon
 Madras, Oregon
 Newport, Oregon
 Oregon Water Corporation
 Pasco, Washington
 Redmond, Oregon
 U. S. Atomic Energy Commission
 Winston-Dillard Water District

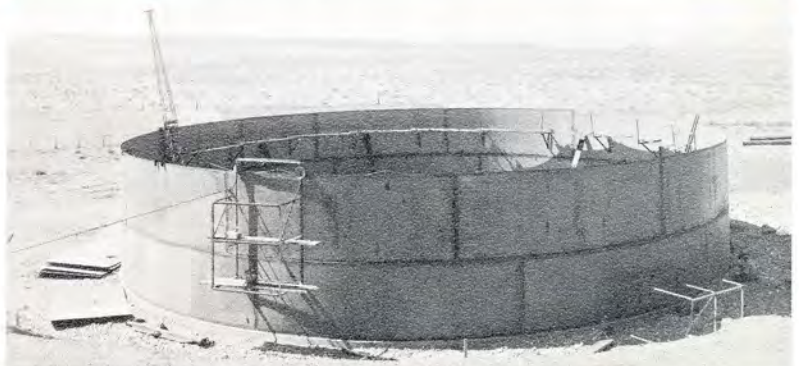
Reservoir and pumping station at Madras, Oregon.



IRRIGATION

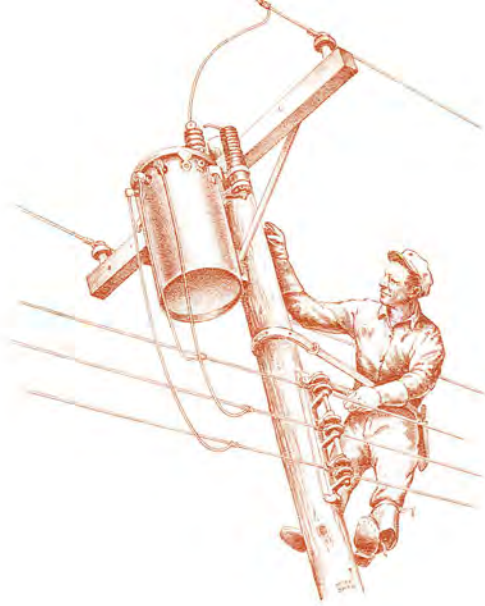
Corvallis Country Club
 Crane Creek Reservoir
 Administration Board, Idaho
 Eugene Country Club
 Fern Ridge Irrigation Association
 Forest Grove, Oregon
 King Hill Irrigation District, Idaho
 Ontario, Oregon
 Opaline Irrigation District, Idaho
 Oregon State Board of Control
 Pendleton Country Club
 Weiser Irrigation District, Idaho
 Willamette Basin Commission

Steel reservoir under construction at Umatilla, Oregon.



POWER

- STEAM GENERATION
- HYDRO GENERATION
- SUBSTATIONS
- DISTRIBUTION

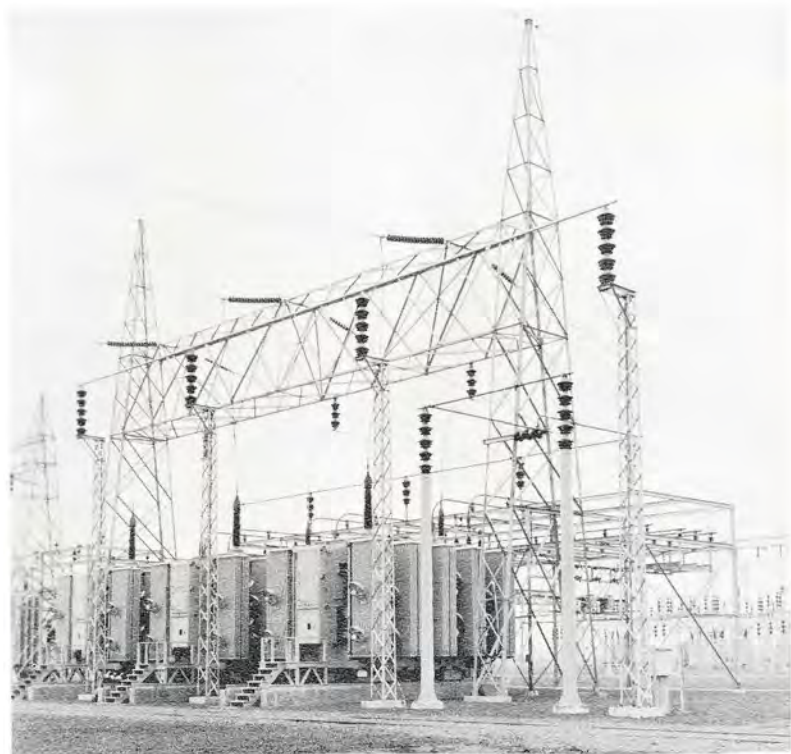


HYDROELECTRIC AND STEAM POWER PROJECTS

Elk Lumber Co., Medford, Oregon
Eugene Water and Electric Board
Evans Products Co., Coos Bay, Oregon
J. Neils Lumber Co., Libby, Montana
Bate Lumber Co., Merlin, Oregon
Milton-Freewater, Oregon
Wahkiakum County P.U.D., Washington

ELECTRIC DISTRIBUTION

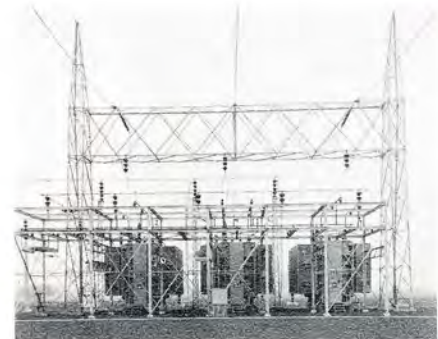
Bandon, Oregon
Benton-Lincoln Electric
Cooperative, Inc.
Blachly-Lane County Cooperative
Electric Association
Bonneville Power Administration
California-Pacific Utilities Co.
Drain, Oregon
Eugene Water and Electric Board
Forest Grove, Oregon
Grant County P.U.D. No. 2
McMinnville, Oregon
Milton-Freewater, Oregon
Oregon State Board of Control
Oregon State Board of Higher
Education
Port Angeles, Washington
Snellstrom Lumber Company
Toledo Water and Light Commission
U. S. Army, Corps of Engineers
U. S. Navy, Bureau of Yards & Docks
Wahkiakum County P.U.D.



Bonneville Power Administration's Chemawa substation. CH₂M has designed two major additions to this facility. The two photos show a 230/115-13.8-kv auto-transformer bank of 250,000-kva forced-air-cooled rating.



Steel penstock for the Montana Light and Power Co., Troy, Mont.





Aerial view of Walterville hydroelectric station.

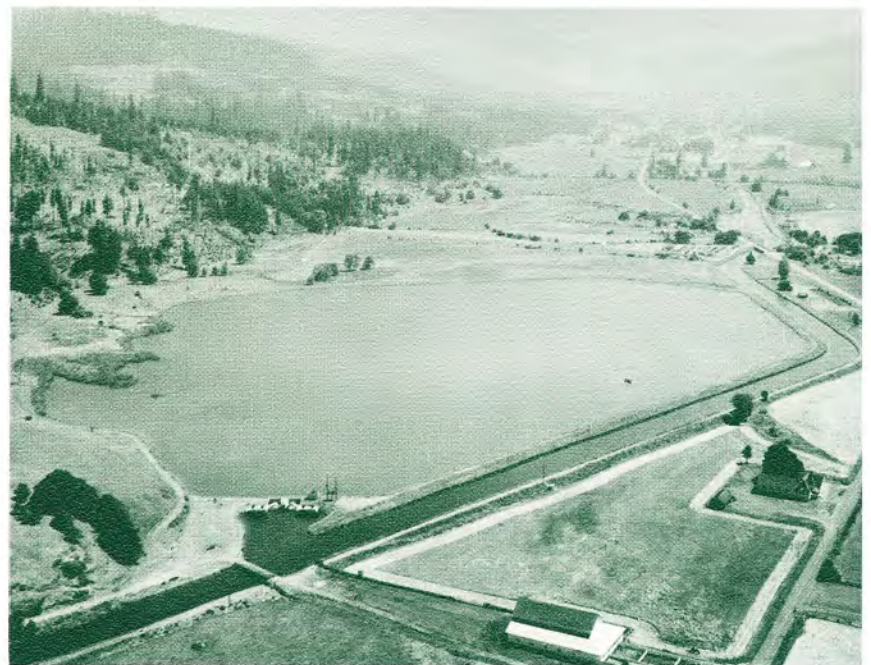


Forebay. Racks and penstock gate in background.



Station superstructure. Siphon spillways and forebay in background.

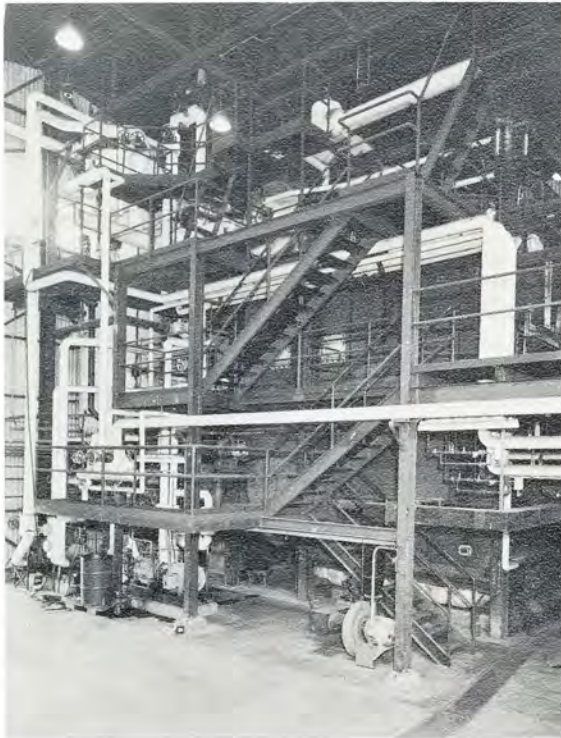
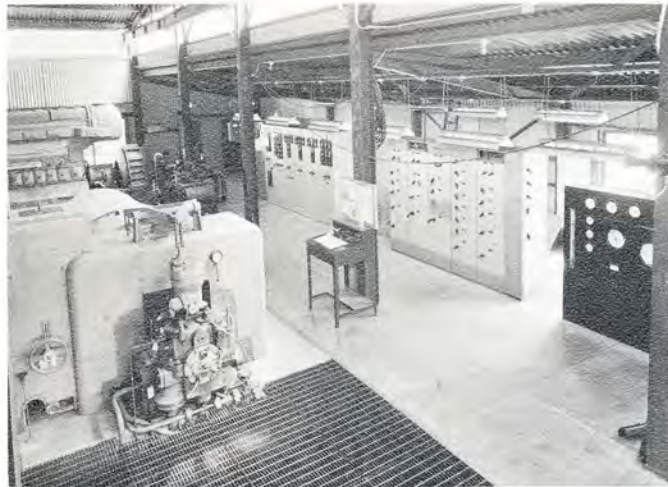
Pumped storage development.



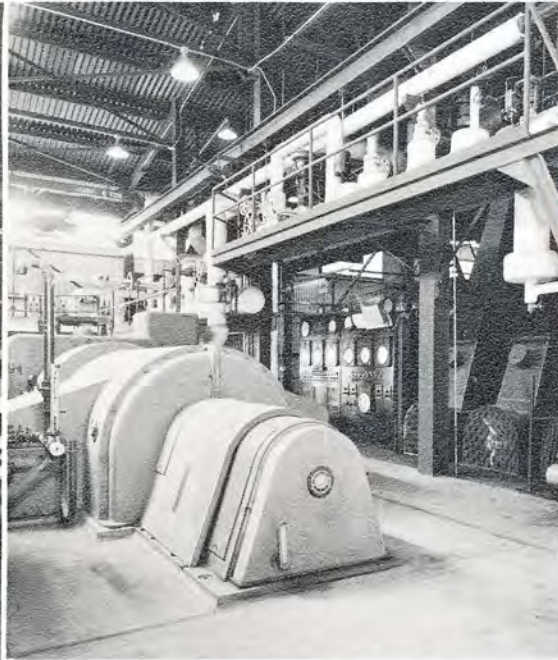
Views of the Eugene Water and Electric Board's 8000-kw hydroelectric station at Walterville on the McKenzie River. This firm designed the present plant, including the pumped storage unit and its special control devices.

Views of the industrial steam power station for the Elk Lumber Company, Medford, Oregon. Boiler is a 50,000-pound-per-hour unit which is the first of two similar units to be installed. Turbine generator capacity is 3,500 kw.

Turbine Gallery, showing unit turbine panel and control board and plant motor control-center.

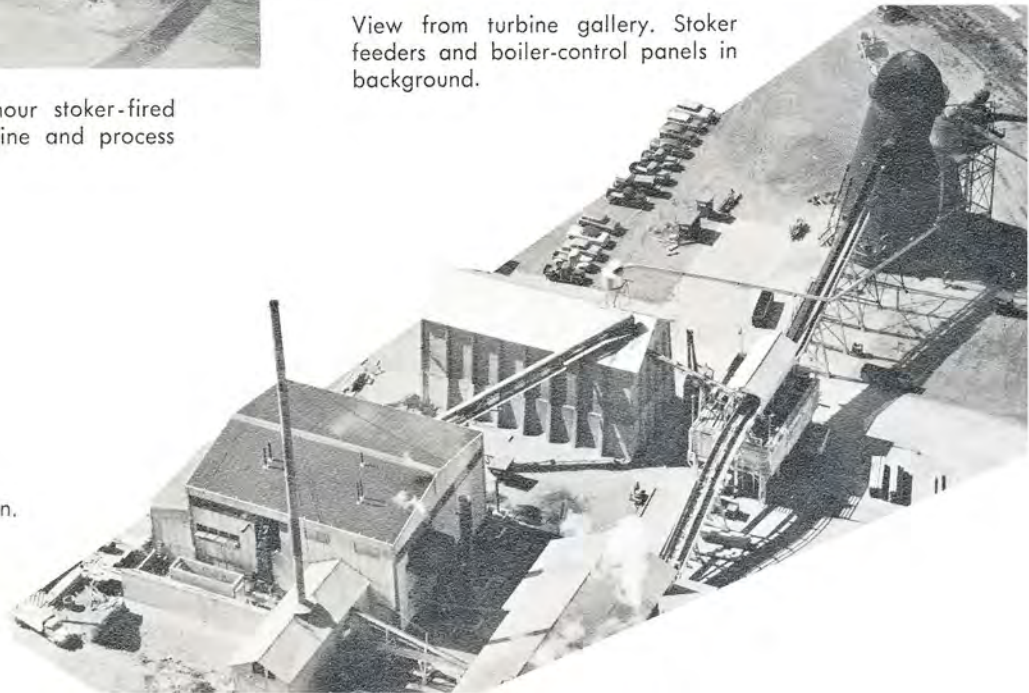


50,000-pound-per-hour stoker-fired boiler supplies turbine and process loads.



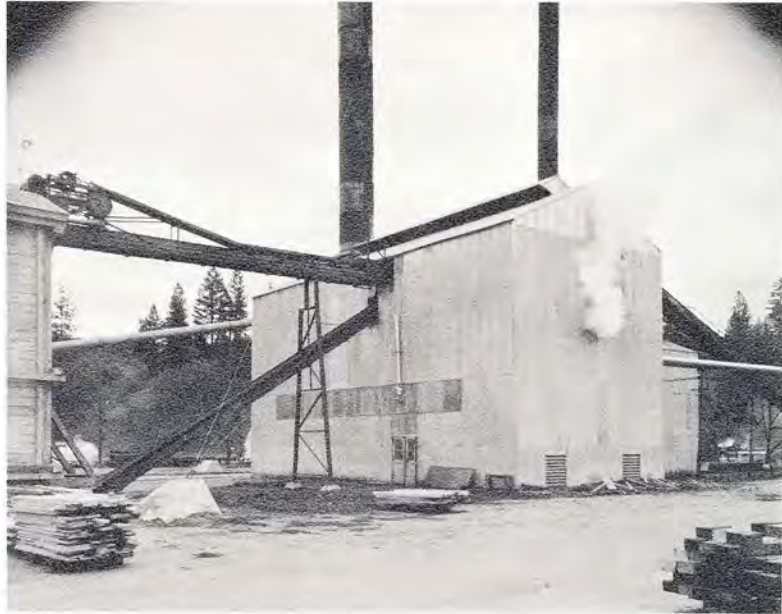
View from turbine gallery. Stoker feeders and boiler-control panels in background.

Aerial view of station.

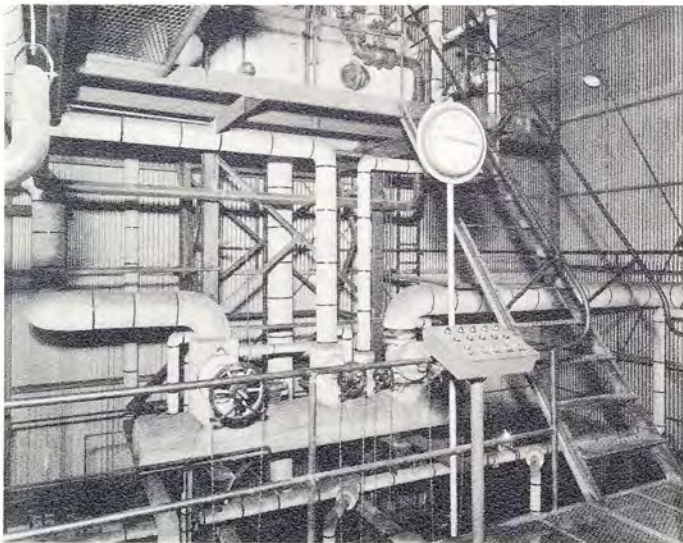


Utilization of wood waste has become a critical consideration in the Pacific Northwest. In many cases, the wood refuse can be used directly as raw material for some other product. In other instances, economic studies show the feasibility of using wood waste for steam generation. CH₂M's staff is qualified to furnish complete engineering service from study to supervision of construction to testing of the plant.

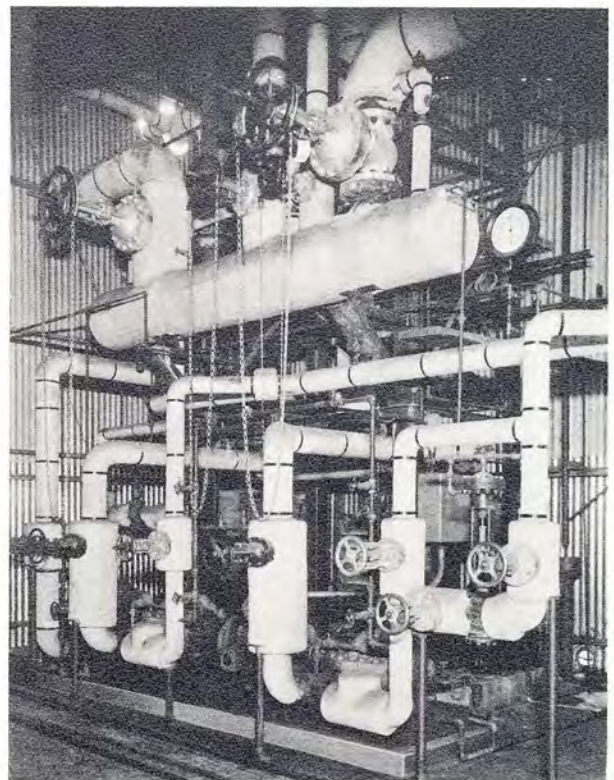
Plant extension which houses an 80,000-pounds-per-hour wood-refuse-fired boiler at the Bate Lumber Company.



Plant header and piping as seen from firing deck. De-aerating heater in background.



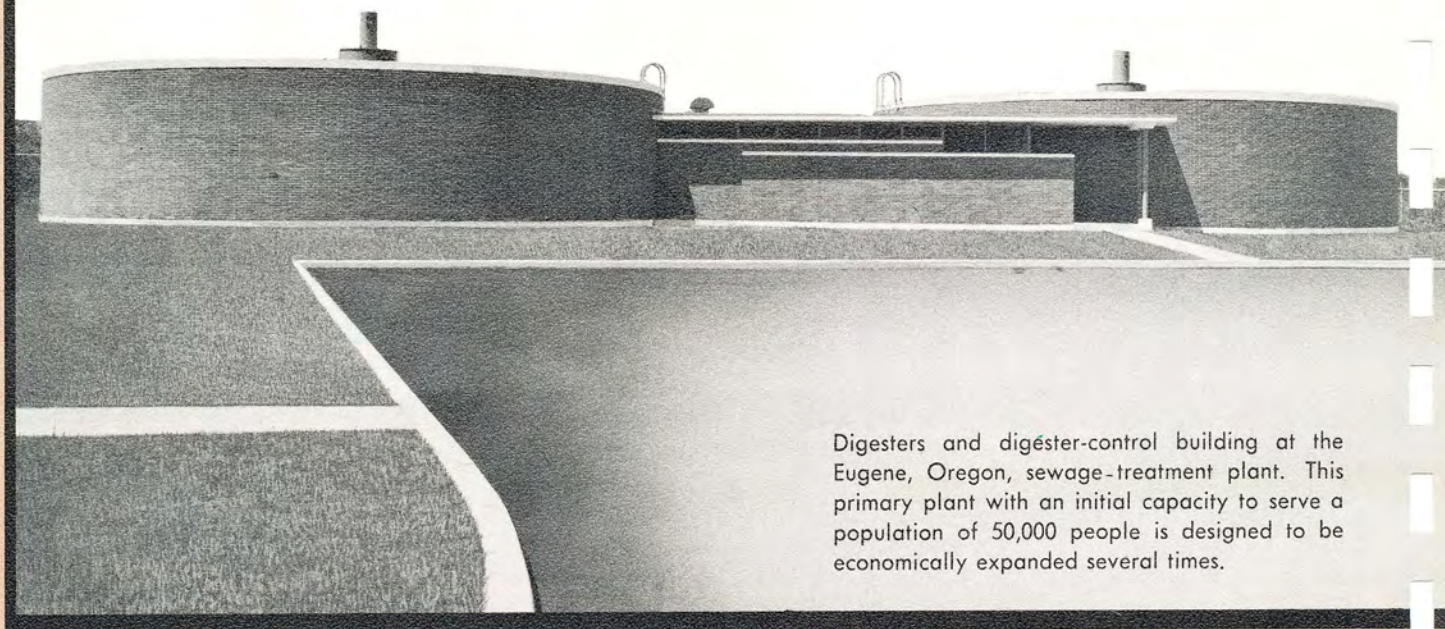
Plant steam header and boiler feed pump installation.



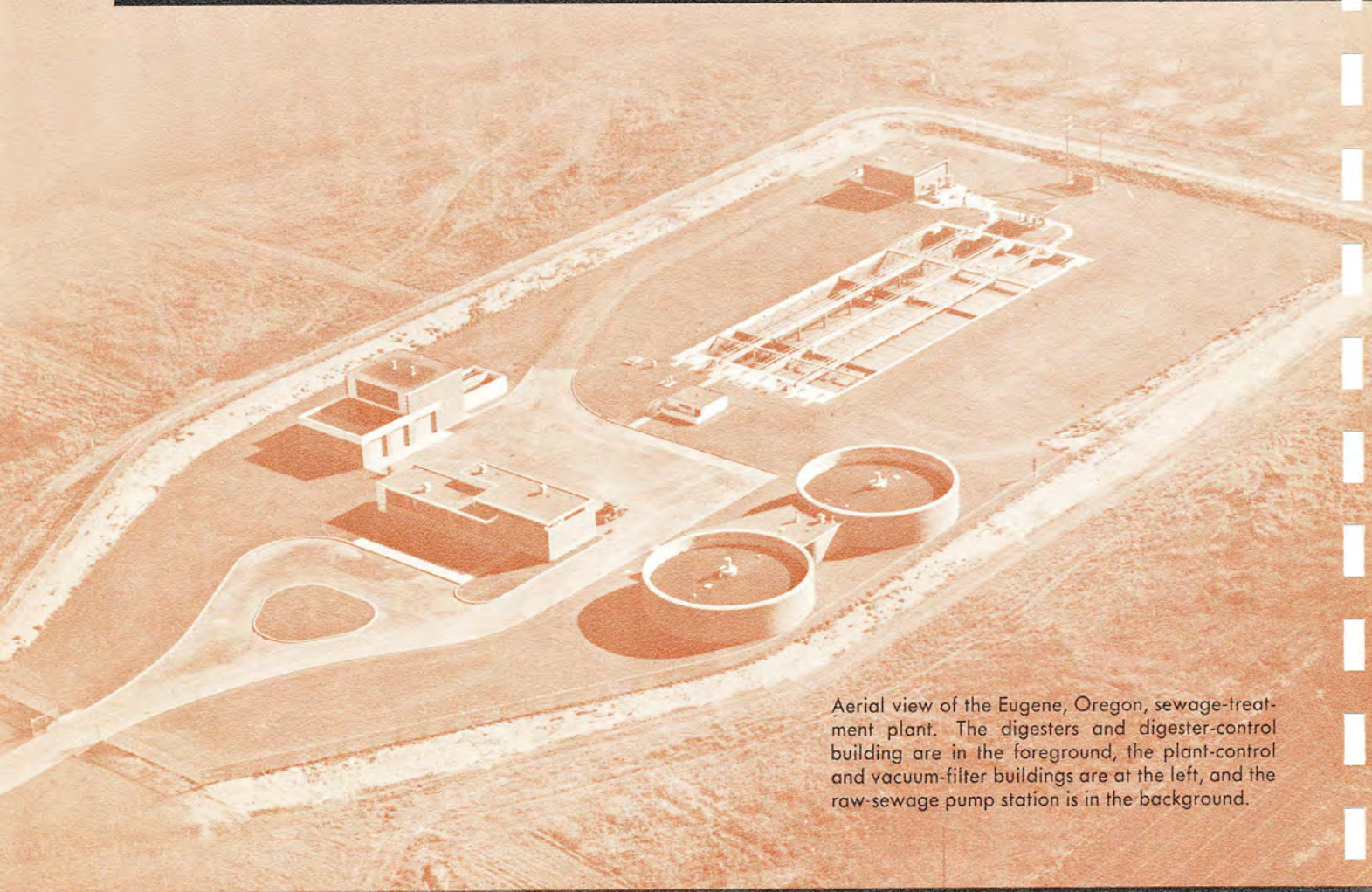
The plant of the Bate Lumber Company, Merlin, Oregon, produces steam power and process steam for an extensive plywood and kiln operation. Boiler capacity is adequate for future electric power generation.

SEWERS AND WASTE DISPOSAL

- COLLECTION
- TREATMENT



Digesters and digester-control building at the Eugene, Oregon, sewage-treatment plant. This primary plant with an initial capacity to serve a population of 50,000 people is designed to be economically expanded several times.



Aerial view of the Eugene, Oregon, sewage-treatment plant. The digesters and digester-control building are in the foreground, the plant-control and vacuum-filter buildings are at the left, and the raw-sewage pump station is in the background.

INVESTIGATIONS AND DESIGNS

SEWER AND SEWAGE DISPOSAL

Albany, Oregon
Bandon, Oregon
Berrydale Sanitary District
Bingen, Washington
Boise, Idaho
Brookings, Oregon
Caldwell, Idaho
Camas, Washington
Canby, Oregon
Cannon Beach, Oregon
Canyonville, Oregon
Carlton, Oregon
Condon, Oregon
Coquille, Oregon
Corvallis, Oregon
Cottage Grove, Oregon
Dallas, Oregon
DeLake, Oregon
Drain, Oregon
Dufur, Oregon
Empire, Oregon
Eugene, Oregon
Eugene School District
Federal Housing Administration
Florence, Oregon
Forest Grove, Oregon
Four Corners Drainage District
Gladstone, Oregon
Green Sanitary District
Harrisburg, Oregon
Hillsboro, Oregon
Homedale, Idaho
Hood River, Oregon
Idaho Falls, Idaho
Jacksonville, Oregon
Klamath County, Oregon
Kuna, Idaho
La Grande, Oregon
Lebanon, Oregon
Maupin, Oregon
McMinnville, Oregon
Milton-Freewater, Oregon
Monroe, Oregon
Myrtle Creek, Oregon
Myrtle Point, Oregon
North Roseburg Sanitary District
Oakland, Oregon
Oakridge, Oregon
Ontario, Oregon
Pasco, Washington
Pendleton, Oregon
Philomath, Oregon
Rainier, Oregon
Rockaway, Oregon
Roseburg, Oregon
Sheridan, Oregon
Silverton, Oregon
Springfield, Oregon
Stanfield, Oregon
St. Helens, Oregon
The Dalles, Oregon
Tillamook, Oregon
Toledo, Oregon
U. S. Army, Corps of Engineers
U. S. Navy, Bureau of Yards & Docks
Vermont Hills Sanitary District
Waldport, Oregon
West Salem, Oregon
Winston, Oregon

SEWAGE-TREATMENT PLANTS

Albany, Oregon
Aluminum Company of America
Bingen, Washington
Boise, Idaho
Camas, Washington
Canby, Oregon
Caldwell, Idaho
Carlton, Oregon
Condon, Oregon
Coquille, Oregon
Corvallis, Oregon
Cottage Grove, Oregon
Drain, Oregon
Eugene, Oregon
Forest Grove, Oregon
Harrisburg, Oregon
Hood River, Oregon
Idaho Falls, Idaho
La Grande, Oregon
Lebanon, Oregon
McMinnville, Oregon
Myrtle Creek, Oregon
Myrtle Point, Oregon
North Roseburg Sanitary District
Oakland, Oregon
Oakridge, Oregon
Oregon State Board of Control
Pendleton, Oregon
Philomath, Oregon
Rockaway, Oregon
Roseburg, Oregon
Sheridan, Oregon
Tillamook, Oregon
Toledo, Oregon
U. S. Army, Corps of Engineers
Waldport, Oregon
Winston, Oregon

INDUSTRIAL WASTE

Ada County Dairymen's Association
Albany, Oregon
Arago Cooperative Cheese Association
Bird's Eye-Snyder Division, General Foods
Bissinger and Co.
Borden's Food Products
Chapman Manufacturing Co.
Columbia River Paper Mills
Corvallis Plywood Corp.
Crown Zellerbach Corp.
Forest Grove, Oregon
Georgia-Pacific Paper Co.
Gresham Berry Growers' Cooperative
Longview Fiber Co.
Menasha Plywood Co.
Morton Milling Company
Pendleton, Oregon
Publishers' Paper Co.
Silver Falls Meat Co.
Steen Bros.
Swishome Chipwood Co.
Western Kraft Corp.
Western States Rendering Co.

72-inch Interceptor Sewer,
Eugene, Oregon.





This attractive plant at McMinnville, Oregon, utilizes a difficult gulch site.

A serious industrial waste problem was solved by the construction of this 90-million-gallon sulphite-liquor storage lagoon for the Crown-Zellerbach Corporation at West Linn, Oregon.



Primary sewage-treatment plant at Corvallis, Oregon.

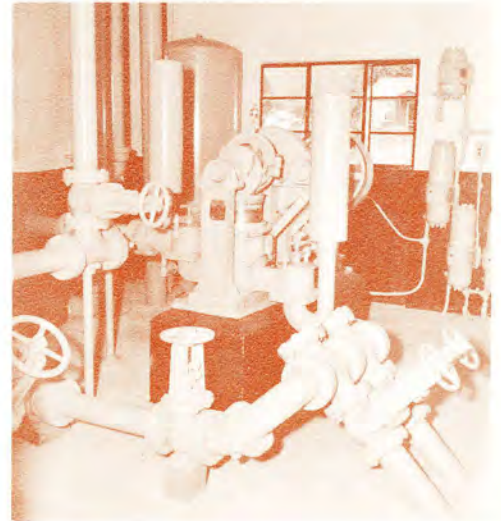




This Albany, Oregon, plant provides primary treatment with secondary facilities to handle industrial loads.

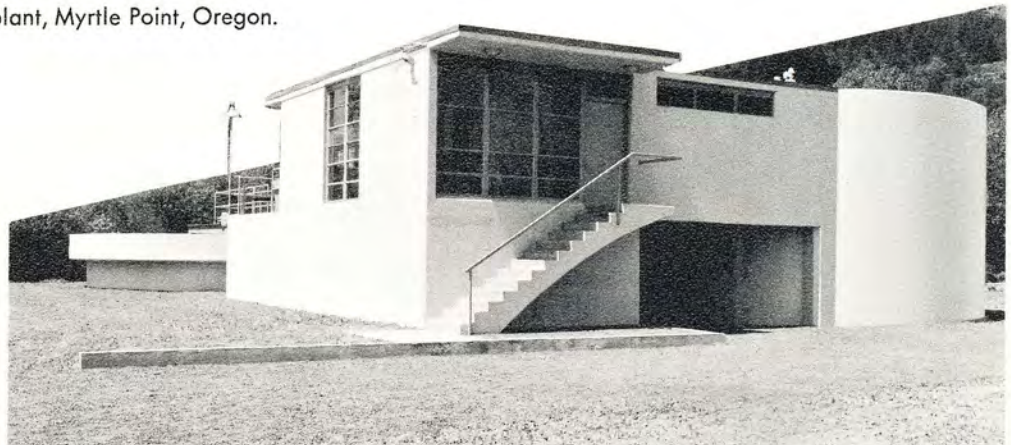


The summertime disposal problem for the Publishers' Paper Company, Oregon City, Oregon, is handled by barging the sulphite liquor to the Columbia River.



Sludge-pumping unit at the Oakridge, Oregon, sewage-treatment plant.

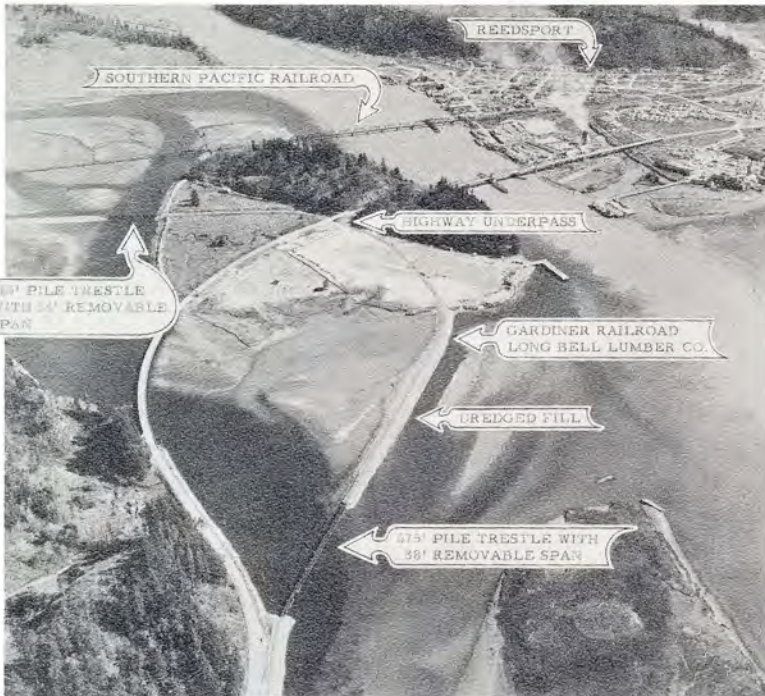
Sewage-treatment plant, Myrtle Point, Oregon.



ROADS, STREETS AND RAILROADS

PROJECTS

- Albany, Oregon
- Baker, Oregon
- Canyonville, Oregon
- Cottage Grove, Oregon
- Drain, Oregon
- Federal Housing Administration
- Florence, Oregon
- Fremont County, Idaho
- Highlands, Inc., Boise, Idaho
- Independent School District of Boise City
- Madras, Oregon
- Myrtle Creek, Oregon
- Myrtle Point, Oregon
- Pope & Talbot Lumber Co.
- Redmond, Oregon
- Tillamook, Oregon
- Toledo, Oregon
- Twin Falls, Idaho
- Umpqua River Navigation Co.
- U. S. Army, Corps of Engineers
- U. S. Navy, Bureau of Yards & Docks
- Weston, Oregon



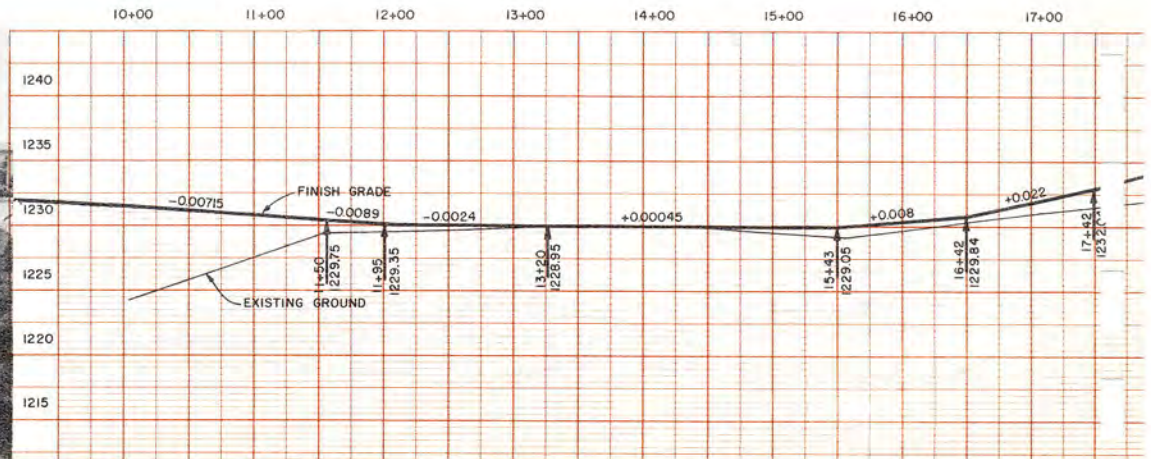
Railroad near Gardiner, Oregon, connects the Southern Pacific Railroad with Long-Bell Lumber Company sawmill and plywood plants.

Three-span, continuous structure carries the Willamette Pass Highway (U. S. 58) over a Pope and Talbot logging road at Oakridge, Oregon.



Cornell, Howland, Hayes and Merryfield has assisted many communities with their rapidly growing street-improvement programs. Engineering services have also been provided on railroads, plant-access roads, logging roads, and their appurtenances.

This small bridge is part of an arterial improvement program at Twin Falls, Idaho.



SOILS

FOUNDATION INVESTIGATIONS

Important economies often result from advance exploration of the soils and foundation conditions at proposed building sites.

CH₂M soils engineers are experienced in making foundation investigations for many types of structures. Through the General Services Company, a wholly owned subsidiary, mobile drilling and sampling equipment is available to move with the engineers and technicians to the job.

Borings are made with hand earth augers, wash boring or diamond drilling equipment. Specialized sampling devices recover samples of the various strata encountered for inspection and testing.

Penetration tests, which indicate the shear strength of the soils, are made during the sampling operations. The samples recovered are taken to the laboratory in sealed cylindrical tubes. The mechanical properties of the soil are then determined to enable the engineer to select the most economical type of foundation for the proposed structure. To insure stable embankments for dams and road structures, the field engineers are equipped to make density and moisture tests for control of filling operations.

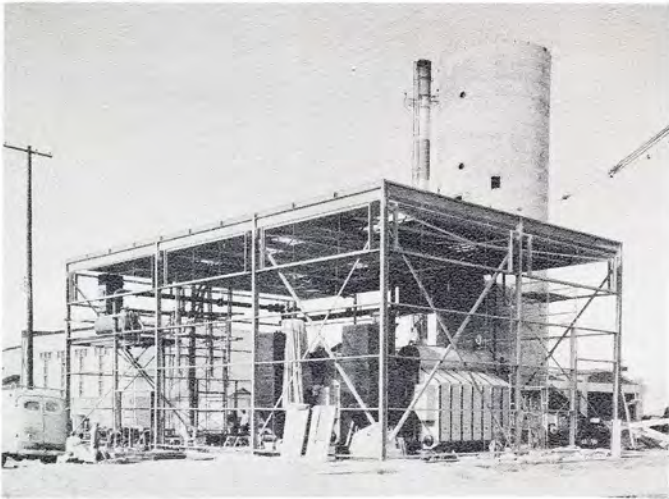
Drilling under way at the site of the Oregon Forest Research Center, Corvallis, Oregon;
James L. Payne, Architect.

PARTIAL LIST OF FOUNDATION INVESTIGATIONS

- Albany General Hospital (James L. Payne, Architect)
- Astoria High School (Stewart and Richardson, Architects)
- Beaverton Swimming Pool (Williams and Martin, Architects)
- Big Creek Dam (Newport, Oregon)
- Coos Head Naval Laboratory
- Eugene YMCA (Hamlin & Martin, Architects)
- Eugene High School
- Eugene Water and Electric Board Warehouse
- Hood River Community Hospital Addition
- Interstate Tractor Co., Eugene and Coquille Stores (Skidmore, Owens and Merrill, Architects)
- Juneau, Alaska, High School (Linn Forrest, Architect)
- J. C. Penney Company Store, Eugene (Percy Bentley, Architect)
- Olallie Dam and Barrier (Georgia-Pacific Paper Co.)
- Oregon Forest Research Center (James L. Payne, Architect)
- Oregon Metallurgical Corporation
- Pacific Telephone & Telegraph, Albany and Baker Exchanges
- Safeway Stores (9 locations)
- Salem Memorial Hospital (James L. Payne, Architect)



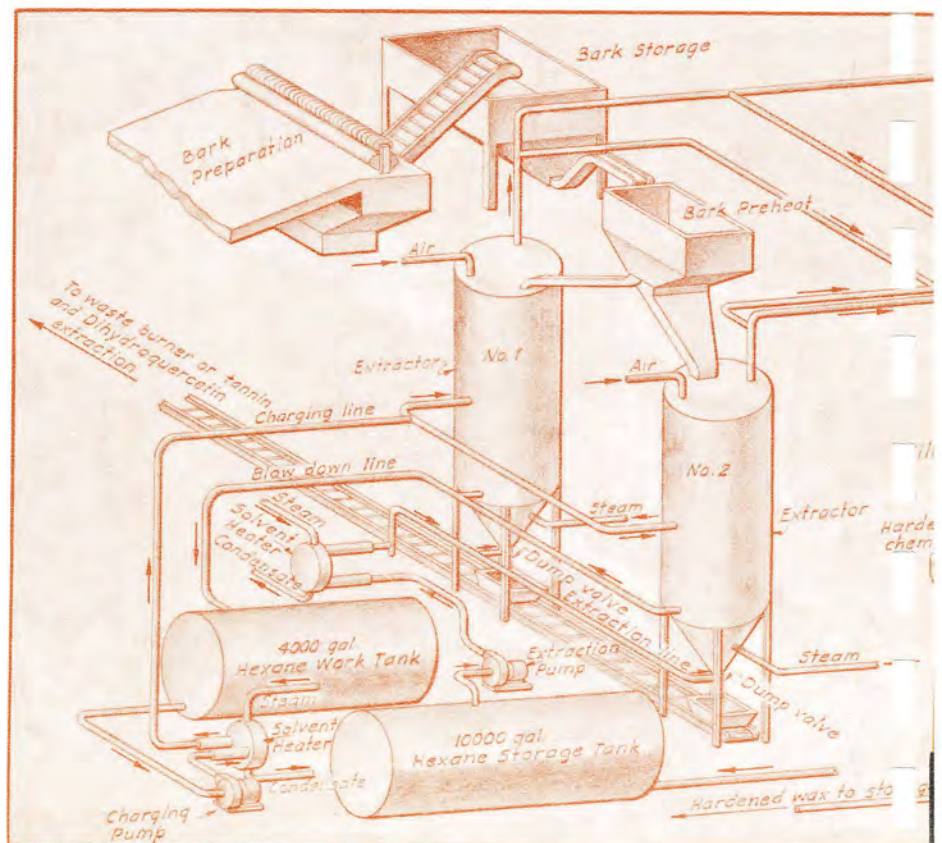
PLANTS AND



Central heating plant,
Klamath Falls Air Force Base.

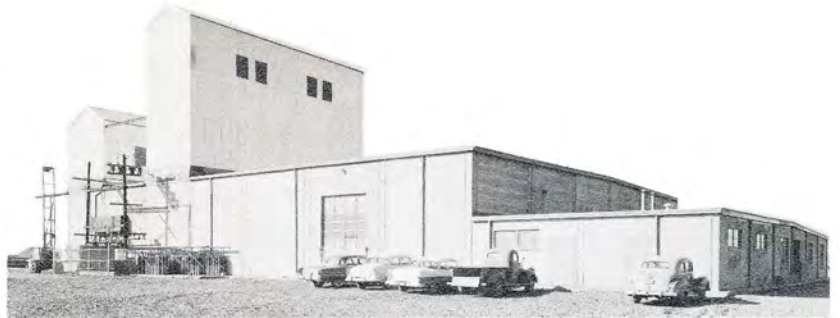
Cornell, Howland, Hayes and Merryfield provides a wide variety of engineering services essential to the development of industrial processes and the construction of industrial plants.

For some industries, the firm has provided site-selection analyses, developed site layouts, and designed the specialized structure required to house the process. For others, it has provided mechanical, electrical, and structural services to supplement the industry's own design staff. In still other instances, the design has been limited to outside facilities such as water supply, waste disposal, power supply, roads, and railroads. Surveying, inspection, and foundation investigation services are also furnished as desired by the owner.



PROCESSES

Oregon Metallurgical Corporation Plant, Albany, Oregon. CH₂M provided the planning, foundation investigation, and building design.



Jet fuel facilities at Klamath Falls Air Force Base.

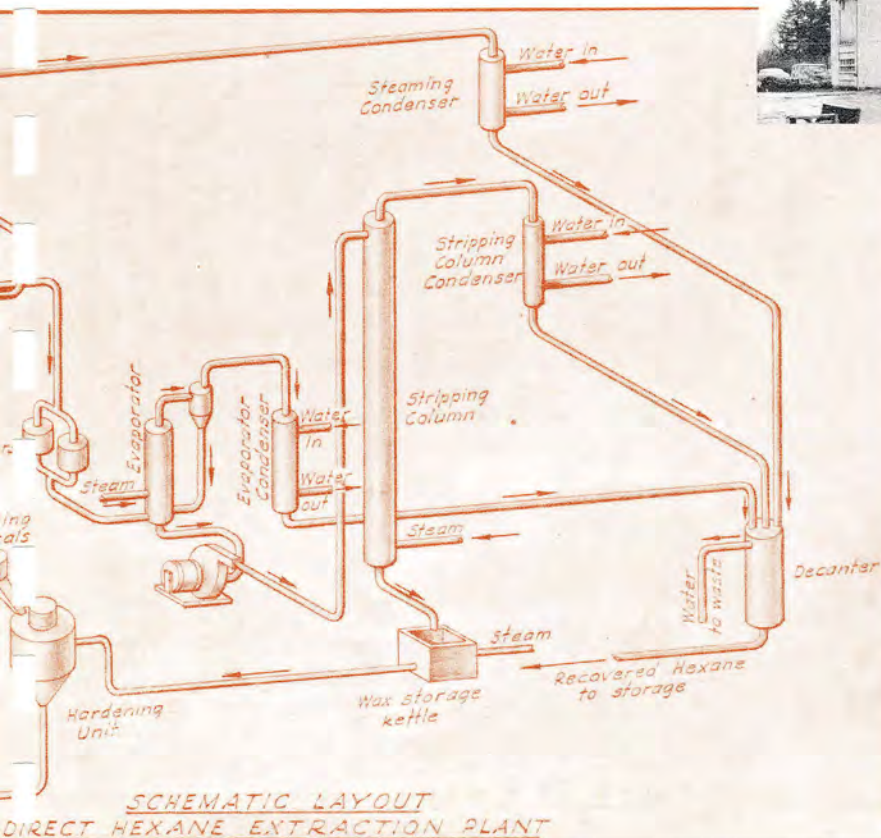


In addition to the plants and industrial facilities shown elsewhere in this brochure, engineering design has been furnished the following industrial clients:

- Bate Lumber Co.
- Columbia River Paper Mills
- Gresham Berry Growers' Cooperative
- National Metallurgical Corp.
- Oregon Metallurgical Corp.
- Publishers' Paper Co.
- Rounds and Conklin
- U. S. Navy, Bureau of Yards & Docks
- U. S. Army, Corps of Engineers
- Wah Chang Corp.
- Westinghouse Electric Corp.



Albany, Oregon, plant of the Wah Chang Corporation. Cornell, Howland, Hayes and Merryfield designed the structures, water supply, and waste-disposal facilities and worked with the Wah Chang engineers on the in-plant power system.



The graphic description of a process shown at the left was prepared in connection with a process-adaptation and preliminary plant-design study.

BUILDING DESIGN



Structural Design

Rigby, Idaho
Idaho Dept. of Highways
Wayland and Cline,
Architects



Heating, Ventilating, and Lighting Design

Garfield School
Corvallis, Oregon
Chris Jeppsen, Architect



Heating, Ventilating and Air Conditioning Design

Central Lincoln PUD
Building, Florence, Ore.
Richard Sundeleaf,
Architect



Heating, Ventilating, Power and Lighting Design

Gerlinger Carrier
Company Plant
Dallas, Oregon
James L. Payne, Architect

- HEATING
- VENTILATING
- AIR CONDITIONING
- ELECTRICAL
- STRUCTURAL

Heating, ventilating, air conditioning, electrical, and structural design for virtually all types of buildings are handled by the CH₂M staff specialists. In conjunction with the design services, specifications and cost estimates are prepared, and experienced personnel are available for inspection of the projects as construction progresses.

The firm takes pride in providing economical, modern designs, using new construction methods and equipment as they become available. One of the first air-to-air reverse-cycle heating and cooling systems to be installed in the Northwest was designed for the Florence office building of the Central Lincoln PUD. High-temperature water, one of the more recent methods developed for distributing heat to separated buildings, was provided for the expansion of the central heating plant at the Mountain Home Air Force Base.

Difficult lighting problems have been solved through the use of special features such as underwater lighting for swimming pools and through specialized mechanical and electronic controls.

Many recent structural projects have utilized tilt-up walls, pre-stressed members, light-weight aggregates, and specialized geometric shapes to take advantage of all the properties of the materials in creating the structure. Investigations of the adequacy of existing structures for many types of service have been made, and special structural additions to existing buildings have been designed.

MECHANICAL, ELECTRICAL, AND STRUCTURAL DESIGN PROJECTS

Architects:

Albany Hospital Addition, Oregon. James L. Payne
 Alpha Delta Pi Sorority, Corvallis. Chris Jeppsen
 Allstate Insurance Building. James L. Payne
 Alpha Omicron Pi Sorority. James J. Gathercoal
 Alpha Phi Sorority. Walter Gordon
 Alpha Tau Omega Fraternity. Chris Jeppsen
 Beaverton Swimming Pool. Williams and Martin
 Benton County Shops
 Borah High School, Boise, Idaho. Associated Architects
 Bush House Museum
 Central Lincoln PUD, Florence Ofc. Richard Sundeleaf
 Consolidated School District No. 9,
 Corvallis, Oregon
 City Center Motel. Chris Jeppsen
 C. L. Corporation, Salem, Oregon.
 Coos Bay Methodist Church. James L. Payne
 Corvallis City Hall
 Corvallis Elks Lodge Steam Room
 Corvallis High School. James J. Gathercoal
 Delta Tau Delta Fraternity. Chris Jeppsen
 East Oregon Publishers Building
 East Junior High School, Boise. Wayland and Cline
 Eugene Water & Elec. Board Shop. Ralph C. Beardsworth
 First Methodist Church, Corvallis. Chris Jeppsen
 Forest Grove Elementary School
 Structural Investigation
 Garfield School, Corvallis, Oregon. Chris Jeppsen
 Gazette-Times Publishers
 Gerlinger Carrier Company Plant. James L. Payne
 Gresham Berry Growers' Co-op.
 Harding School, Corvallis, Oregon. James J. Gathercoal
 I.O.O.F. Hall, Corvallis, Oregon
 Johnson Building. James L. Payne
 Lebanon Clinic. James L. Payne
 Masonic Lodge, Corvallis, Oregon. Cleo Jenkins
 Nampa State School, Utility
 Building and Cannery. Wayland & Cline
 Oregon Forest Research Center. James L. Payne
 Oregon State College Dormitories. James J. Gathercoal
 Pacific Power & Light Building. Chris Jeppsen
 Pendleton Grain Growers, Inc.
 Pioneer Trust Building Structural
 Investigation. James L. Payne
 Pi Beta Phi Sorority
 Portland General Electric Building. James L. Payne
 Reedsport Post Office
 Rosboro Lumber Company
 Roosevelt School, Corvallis, Ore. James J. Gathercoal
 Sigma Alpha Epsilon Fraternity. Chris Jeppsen
 Salem Clinic. James L. Payne
 Salem Lutheran Church. James L. Payne
 Seaside High School Structural
 Investigation
 Skaggs Building, Boise, Idaho. Wayland & Cline
 Idaho Dept. Highways Maintenance
 Shop, Rigby, Idaho. Wayland & Cline
 Idaho Dept. Highways Maintenance
 Shop, Strawberry Glen, Idaho. Wayland & Cline
 Idaho Dept. Highways Maintenance
 Shop, Shoshone, Idaho. Cecil E. Jones
 St. Helens School District
 State of Oregon Printing Dept. James L. Payne
 Twin Falls Elementary Schools. Wayland & Cline
 Umpqua River Navigation Office
 Umpqua River Navigation Bunkers
 University of Idaho, Addition to
 Memorial Gymnasium. Victor N. Jones & Assoc.
 University of Idaho, Dormitory. A. E. Dropping & Assoc.
 U.S.A.F., Air Defense Command
 U.S. Army, Corps of Engineer
 U.S. Navy, Bureau of Yards & Docks
 Walla Walla, Washington
 Western Equipment Co. Nat J. Adams
 Western Mennonite School
 Western Paper Converting Co. James L. Payne
 Whiteside Bldg., Corvallis, Ore. Chris Jeppsen
 Wholesalers, Inc., Boise, Idaho
 F.W. Woolworth Co., Boise, Idaho
 Y.M.C.A., Salem, Oregon. James L. Payne

Structural, Heating, Ventilating, and Electrical Design

Alert Hangar
 Klamath Falls
 Air Force Base



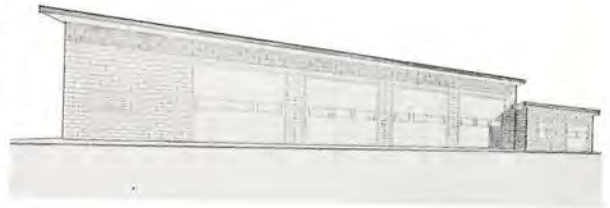
Maintenance Shop Design

Benton County,
 Oregon



Fire Station Design

Mountain Home
 Air Force Base
 Williams and Martin,
 Associate Architects

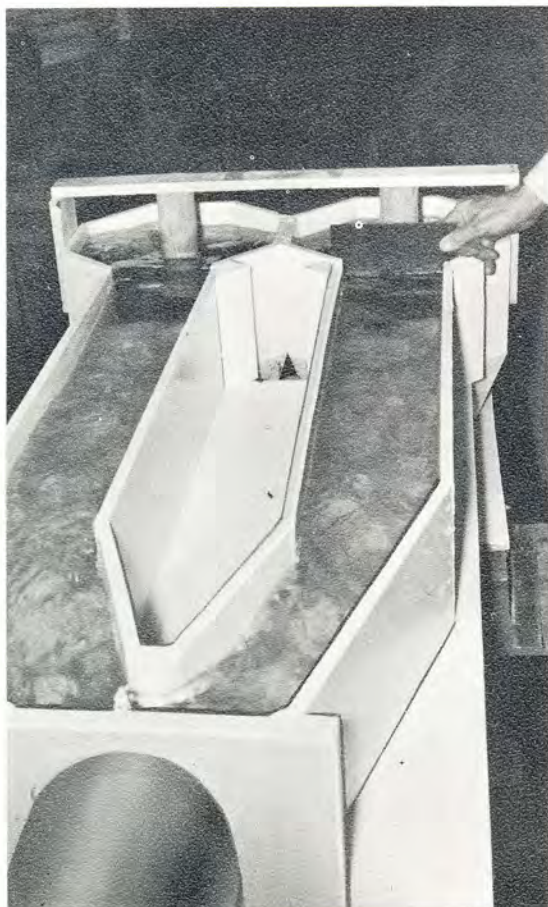


Structural Design

Eugene Water and
 Electric Board Shops
 Ralph C. Beardsworth,
 Architect



RESEARCH AND DEVELOPMENT

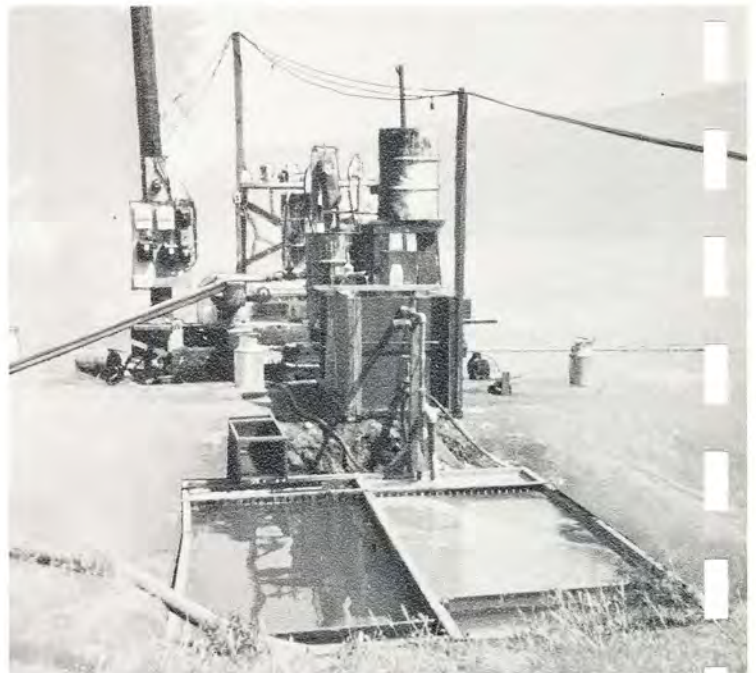


New ideas and new equipment must be constantly developed and applied if engineering designs are to provide the greatest benefits possible from the rapidly expanding technology. The CH₂M technical staff is constantly engaged in research and development work in connection with design projects undertaken by the firm. This staff is also available to work directly for others in research and development fields.

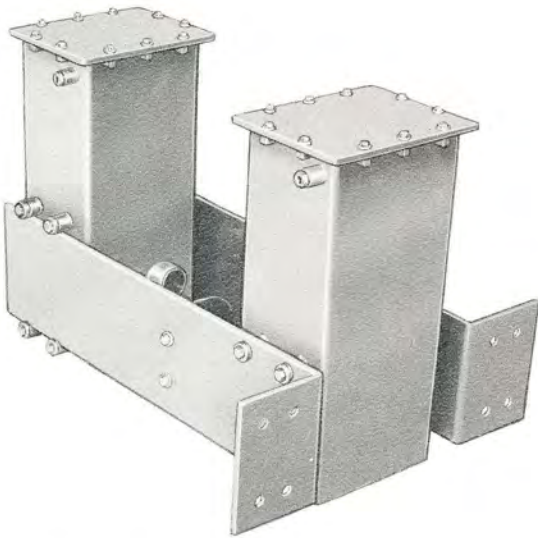
As research and development tools, models and pilot plants are extensively used. Models aid in developing and designing plant layouts, hydraulic structures, pumping stations, and specialized equipment. Pilot plants furnish data concerning the physical and economic feasibility of alternative processes.

The photos at the left are of a design analysis model of an intake for the Waltherville hydroelectric station.

At the lower left is a model of the influent channels and pump intake chambers of a sewage pumping station utilizing the Flomatcher method of pump control.



Pilot plants are used to develop operating procedures and determine costs for treatment of special wastes. This pilot plant compared chemical precipitation to bio-chemical treatment of organic industrial wastes.



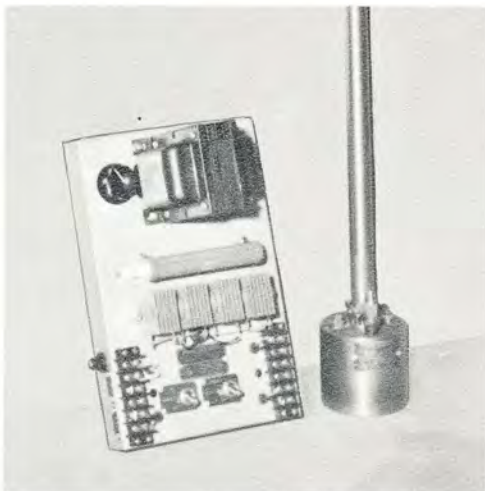
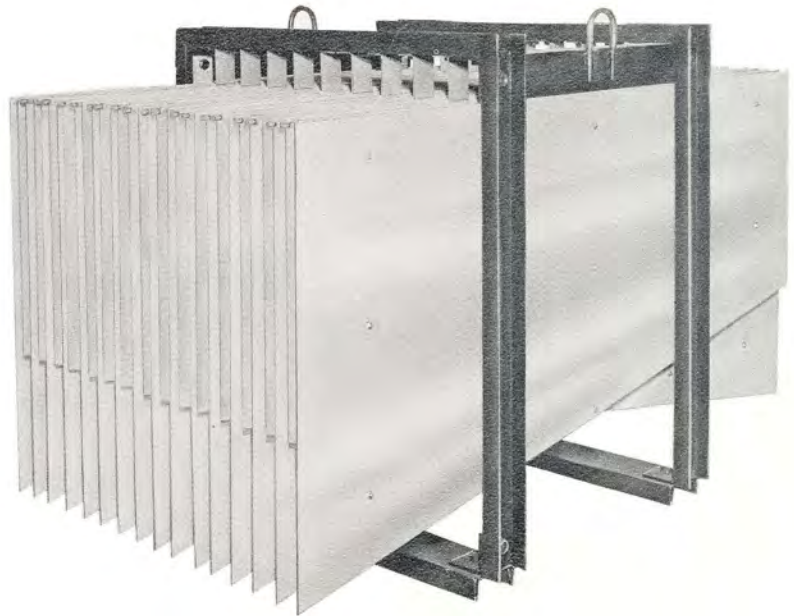
FLOWATCHER

The Flowatcher, developed by CH₂M, is a photo-electric-cell unit which automatically excludes turbid water from municipal and industrial water-supply systems. This sensing device located in the supply intake actuates a gate to divert unacceptable water from the supply conduit.

FLOMATCHER

The Flomatcher, developed and patented by CH₂M, is a variable-flow pumping unit, the output of which exactly equals the flow to the pump. It utilizes a wound rotor motor with the rotor circuit connected to a water rheostat. This device can be constructed to provide for pumping of a fixed or variable portion of the flow.

The Flomatcher reduces the capital cost of pumping stations by eliminating deep wet wells and multiple pumping units. Maintenance is simplified since fewer and larger pumps (which are less likely to clog) are used. Operating costs may be lowered since less pumping head is required because of the reduction of wet-well depth and pipe-line friction.



MANOPOT

CH₂M has also developed the Manopot, a pressure-voltage transducer having no moving mechanical parts and no delicate or short-lived electronic components. The Manopot is used in control systems where great reliability and long life as well as accurate operation are essential.



RECREATION

- SWIMMING POOLS
- PLAYGROUNDS
- ATHLETIC FIELDS
- RECREATION AREA PLANNING

To provide the greatest service possible, a recreation facility must utilize the space efficiently, must be pleasing to the eye, and must insure safe and healthful conditions for the using public. The facility also must provide continuous service with a minimum of maintenance and must be economical to operate, for recreation projects often have very limited budgets.

To fulfill all these requirements for beauty, service, and economy, CH₂M applies its special engineering skills to recreational as well as other projects.

SWIMMING POOL DESIGN

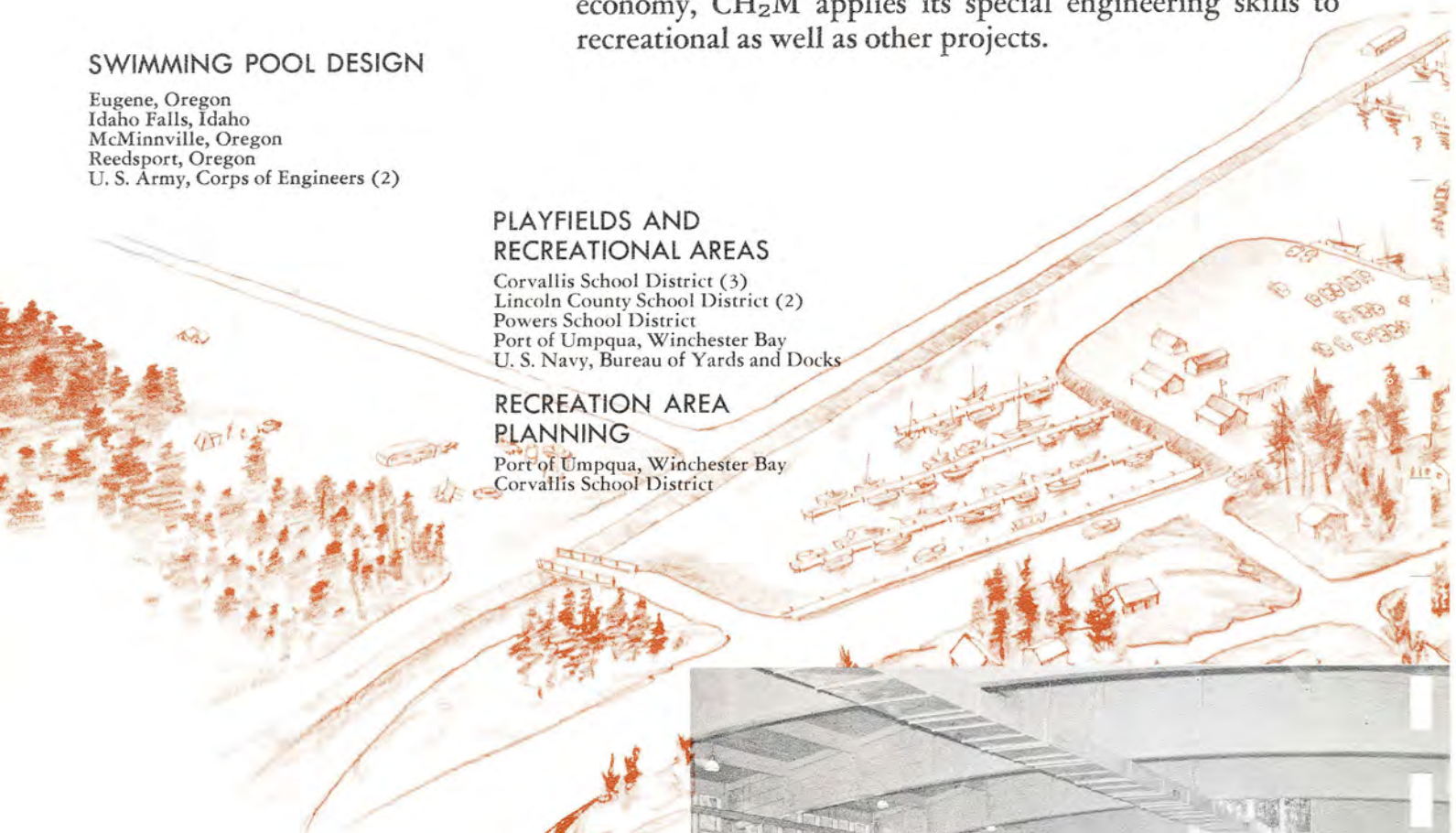
Eugene, Oregon
Idaho Falls, Idaho
McMinnville, Oregon
Reedsport, Oregon
U. S. Army, Corps of Engineers (2)

PLAYFIELDS AND RECREATIONAL AREAS

Corvallis School District (3)
Lincoln County School District (2)
Powers School District
Port of Umpqua, Winchester Bay
U. S. Navy, Bureau of Yards and Docks

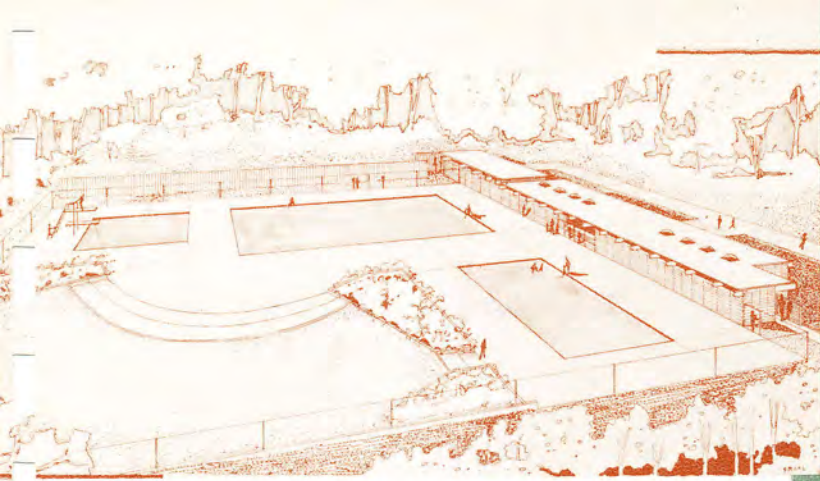
RECREATION AREA PLANNING

Port of Umpqua, Winchester Bay
Corvallis School District



Swimming Pool
Reedsport, Oregon
Wilmsen & Endicott, Building Architects





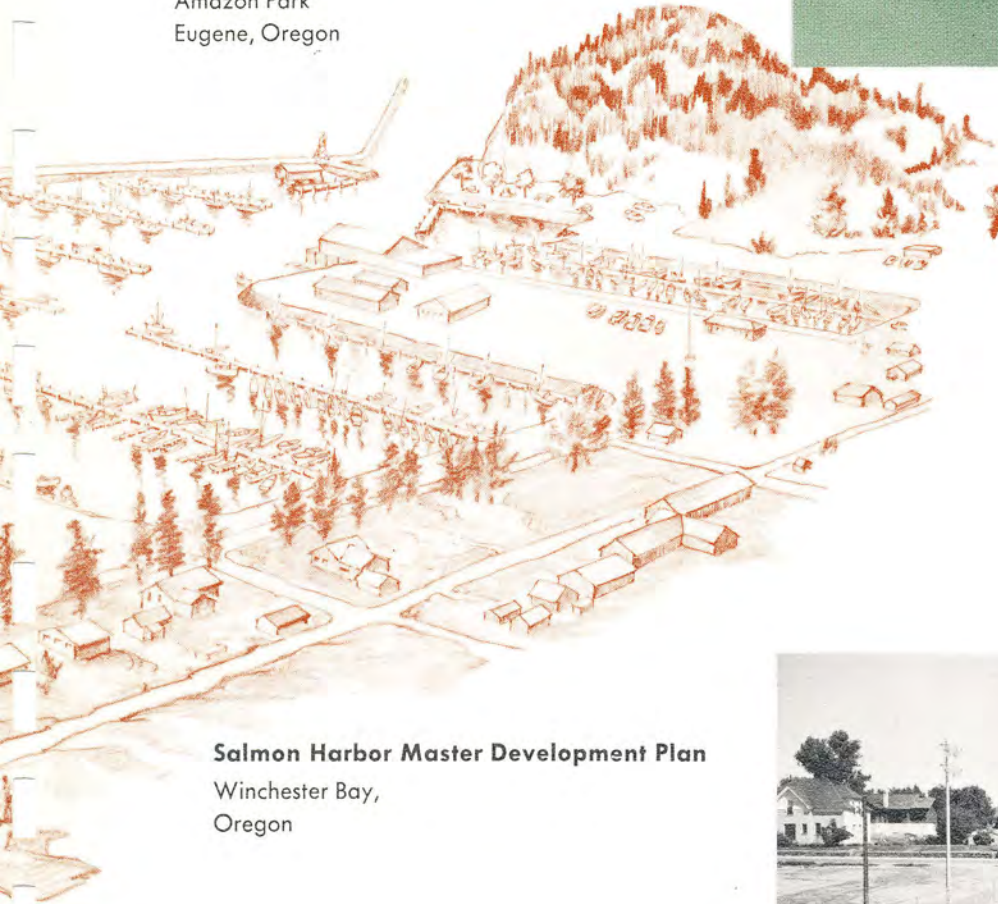
Swimming Pool

Amazon Park
Eugene, Oregon



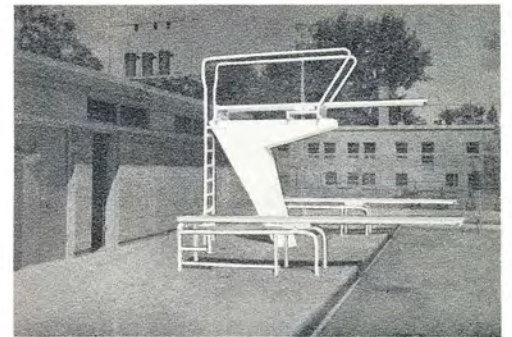
Outdoor-Indoor Swimming Pools

McMinnville, Oregon
Chris Jeppsen, Associate Architect



Salmon Harbor Master Development Plan

Winchester Bay,
Oregon



Base Theater No. 2

Mountain Home, Idaho
Williams and Martin, Associate Architects



Swimming Pool

Idaho Falls, Idaho
Wayland, Woodmansee and Cline, Associate Architects

Types of projects and clients not previously described in this brochure include the following:

AIRPORT LIGHTING

Corvallis Airport

APPRAISALS

Brookings, Oregon

California-Pacific Utilities Co.

Deschutes Valley Water District

General Insurance Co. of America

Griff Davis Water Co.

Jerome Water Co., Jerome, Idaho

Milton-Freewater, Oregon

Philomath, Oregon

Salem, Oregon

Springfield, Oregon

AREA PLANNING

Douglas County, Oregon

Florence, Oregon, Chamber of Commerce

Freeway Shopping Center,
Albany, Oregon

Independent School District of Boise City

Lincoln County School District

Port of Portland Commission

Toledo, Oregon, Chamber of Commerce

U. S. Army, Corps of Engineers

EARTH DAMS AND EARTHWORK

Bohemia Lumber Co.

Corvallis School District

Crown-Zellerbach Corp.

Eugene Water and Electric Board

Larson Lumber Co.

Mount Baldy Lumber Co.

City of Newport, Oregon

Pope and Talbot Lumber Co.

Peak Plywood Co.

John Thompson Lumber Co.

U. S. Army, Corps of Engineers

West Gate Lumber Co.

GAS SYSTEM, STUDY, DESIGN, CONSULTATION

Burley, Idaho

Caldwell, Idaho

Meridian, Idaho

State of Idaho P. U. C.

Weiser, Idaho

Rupert, Idaho

CORROSION CONTROL

Eugene Country Club

Forest Grove, Oregon

Georgia-Pacific Paper Co.

Hood River, Oregon

Lebanon School District

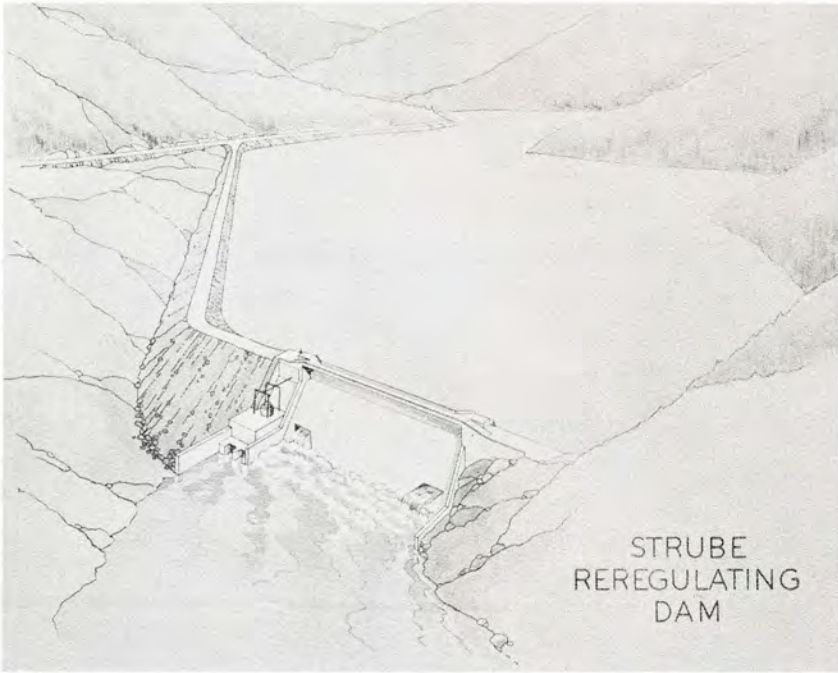




POWER

McKenzie River hydroelectric studies made for the Eugene Water and Electric Board included the Beaver Marsh and Carmen-Smith projects.

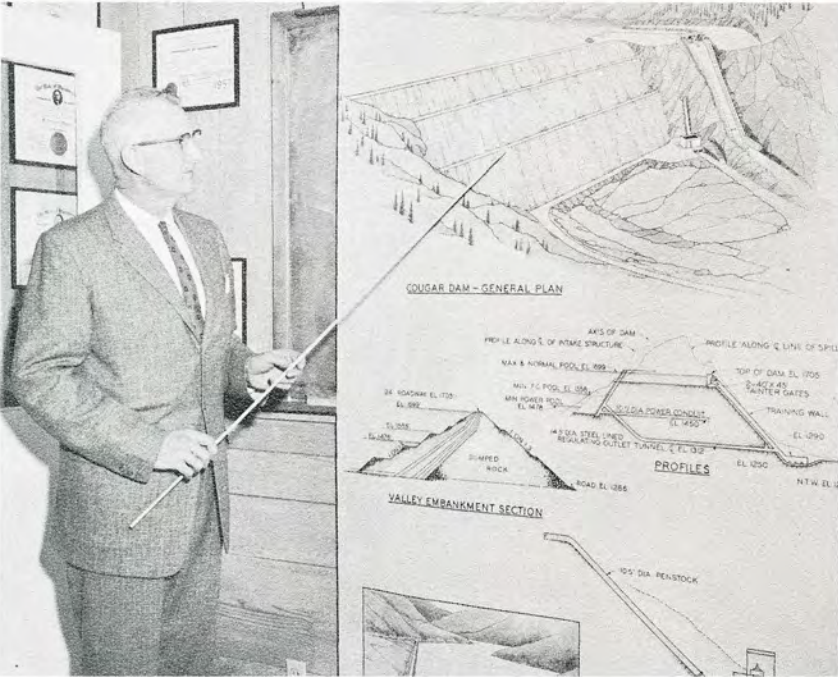




STRUBE
REREGULATING
DAM

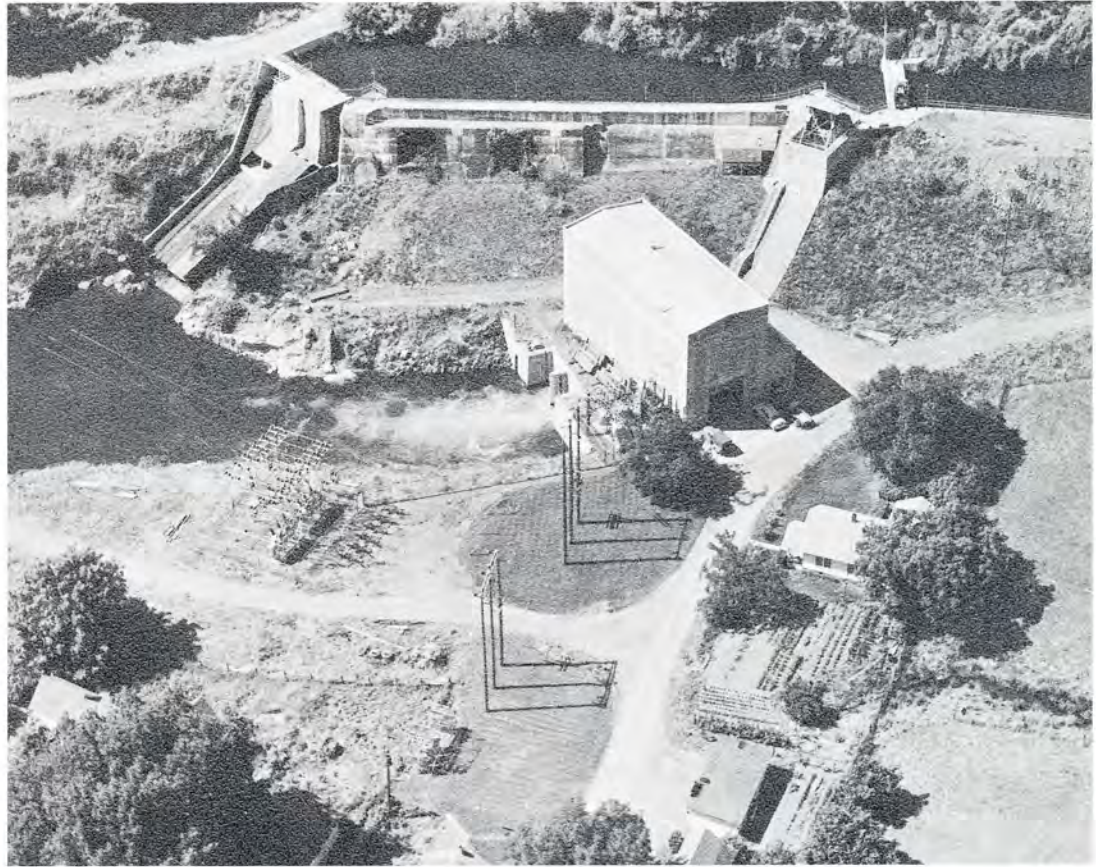


Strube re-regulating dam on the McKenzie River.



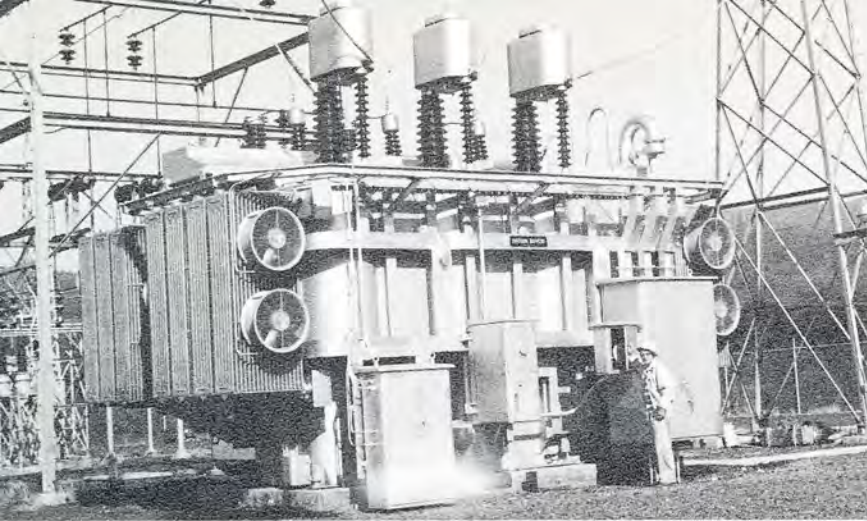
Cougar hydroelectric project studies and preliminary design were made for the Eugene Water and Electric Board.

Eugene Water & Electric Board's 8,000 KW Waltherville hydroelectric station on the McKenzie River. Work included design of present plant, pumped storage unit and special control devices.

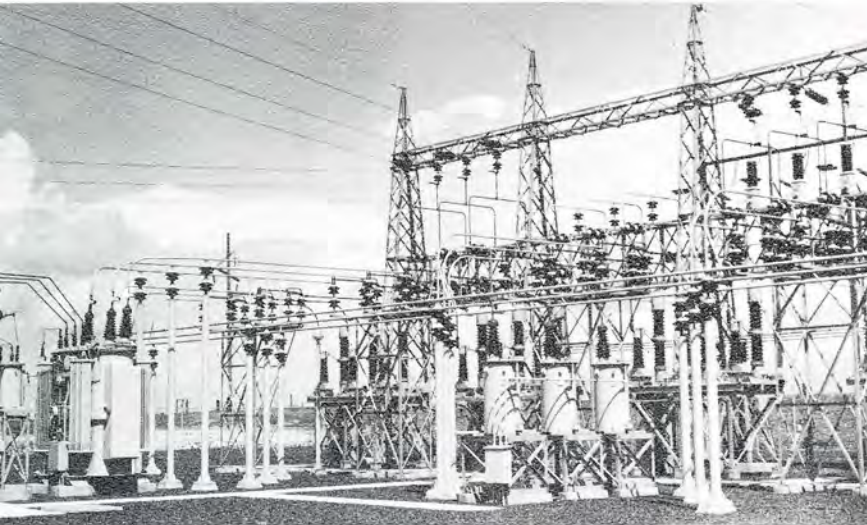


Peaking capacity is provided by the pumped storage unit at Eugene Water & Electric Board's Waltherville Hydroelectric station.

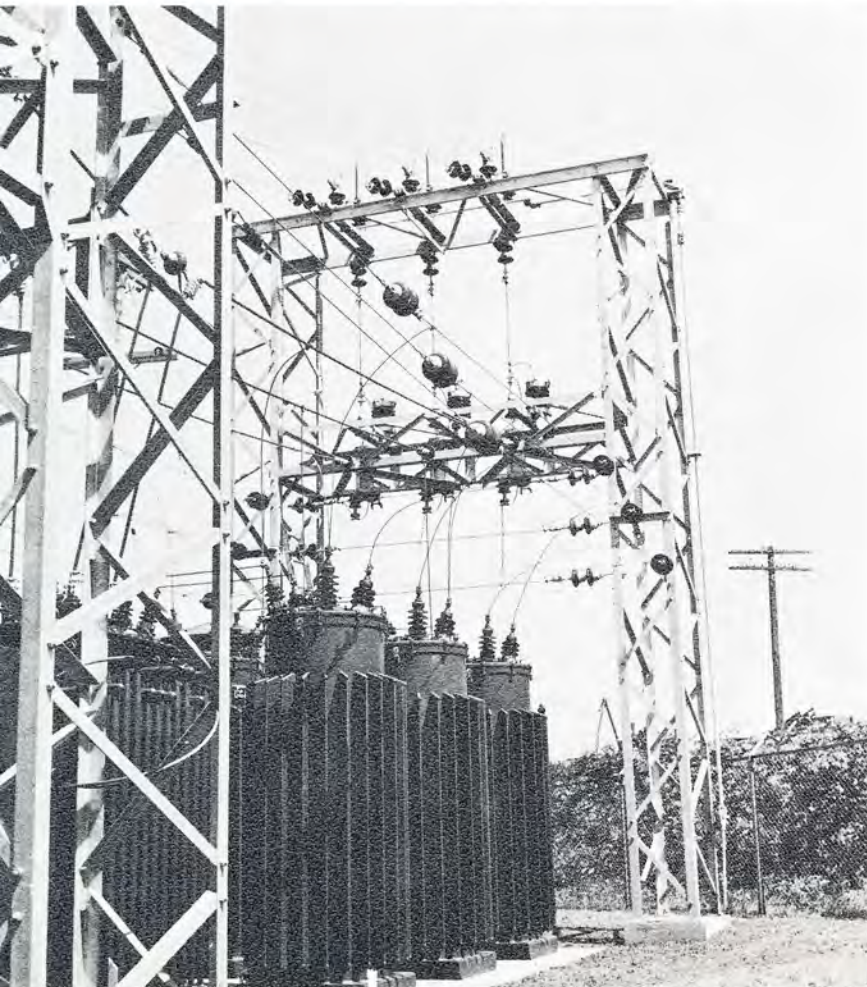




Giant transformer at the Fairmont substation, one of seven designed for the Northwest transmission system of the Bonneville Power Administration.



69 KV switchrack at the Roundup Substation, near Pendleton, Oregon, another in the Bonneville system.

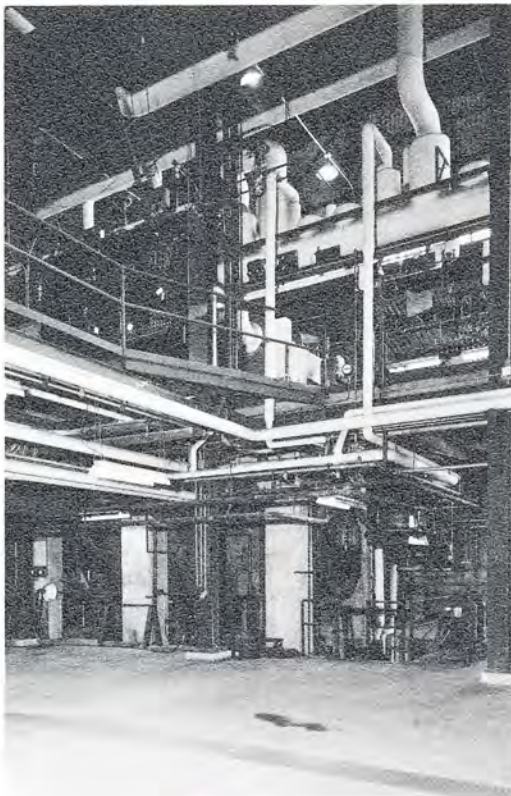


Six existing transformers were utilized in this primary network substation for the City of McMinnville, Oregon.

Additional units for the Leaburg hydroelectric project on the McKenzie River for Eugene Water & Electric Board.



Steel penstock at Troy, Montana, for Montana Light & Power Company.

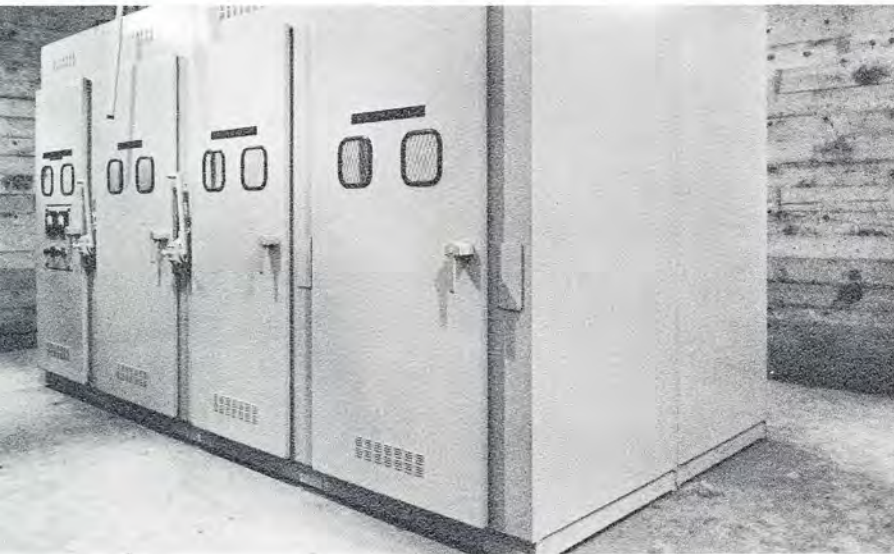


Wet fuel and air pollution problems were design considerations in stoker-fired boiler at the Elk Lumber Company's 3,500 KW steam power installation at Medford, Oregon.

Supervisory control system for operation from a central control room was designed for the 3,000 KW Lower Hydroelectric Plant of the City of Idaho Falls, Idaho. Other work included design of repairs and renovation for the powerhouse and spillway structures.



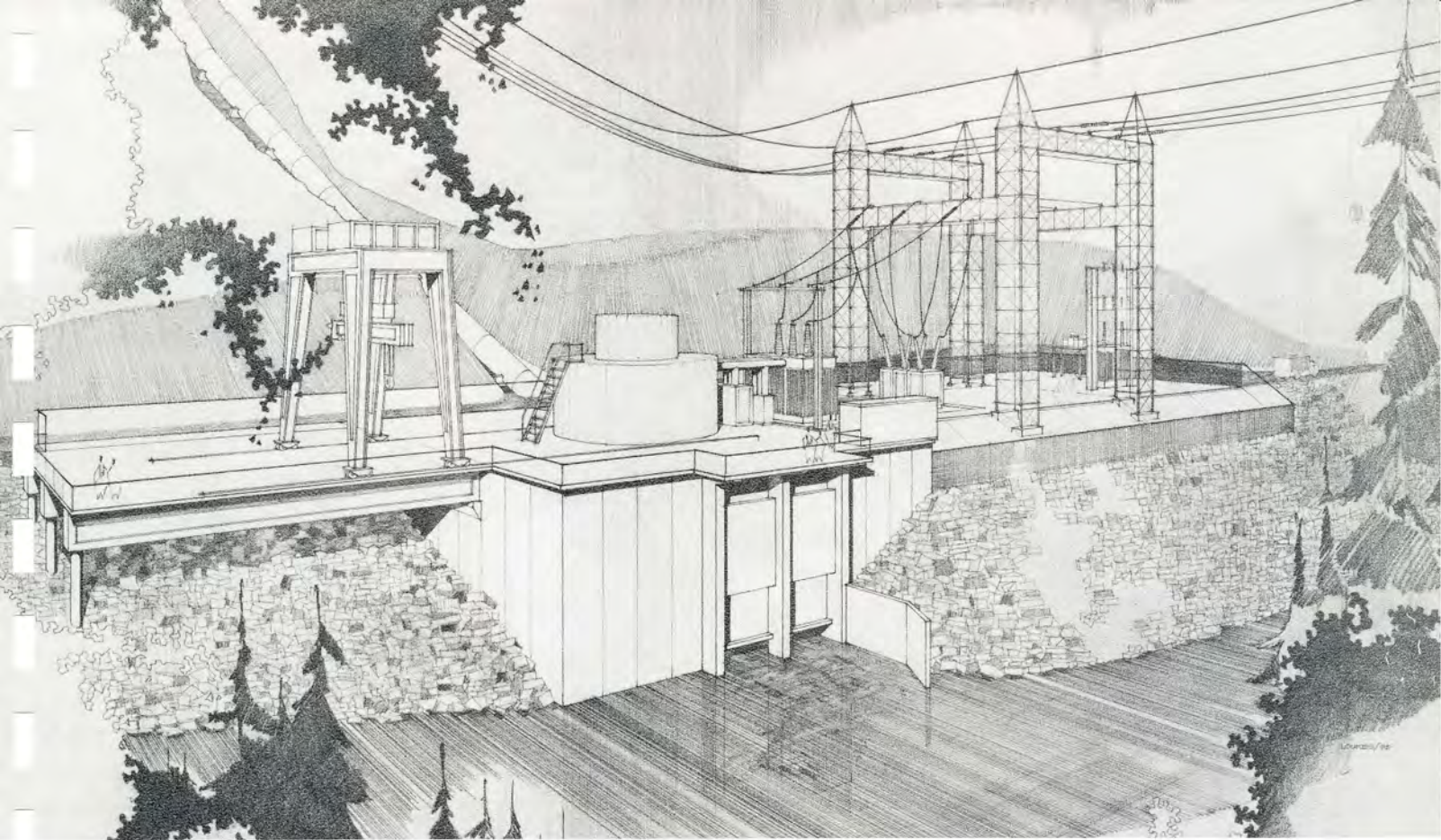
Underground double radial 11,000-volt electric distribution system was designed to serve Oregon's State Capitol and the other State Buildings around the Capitol Mall.



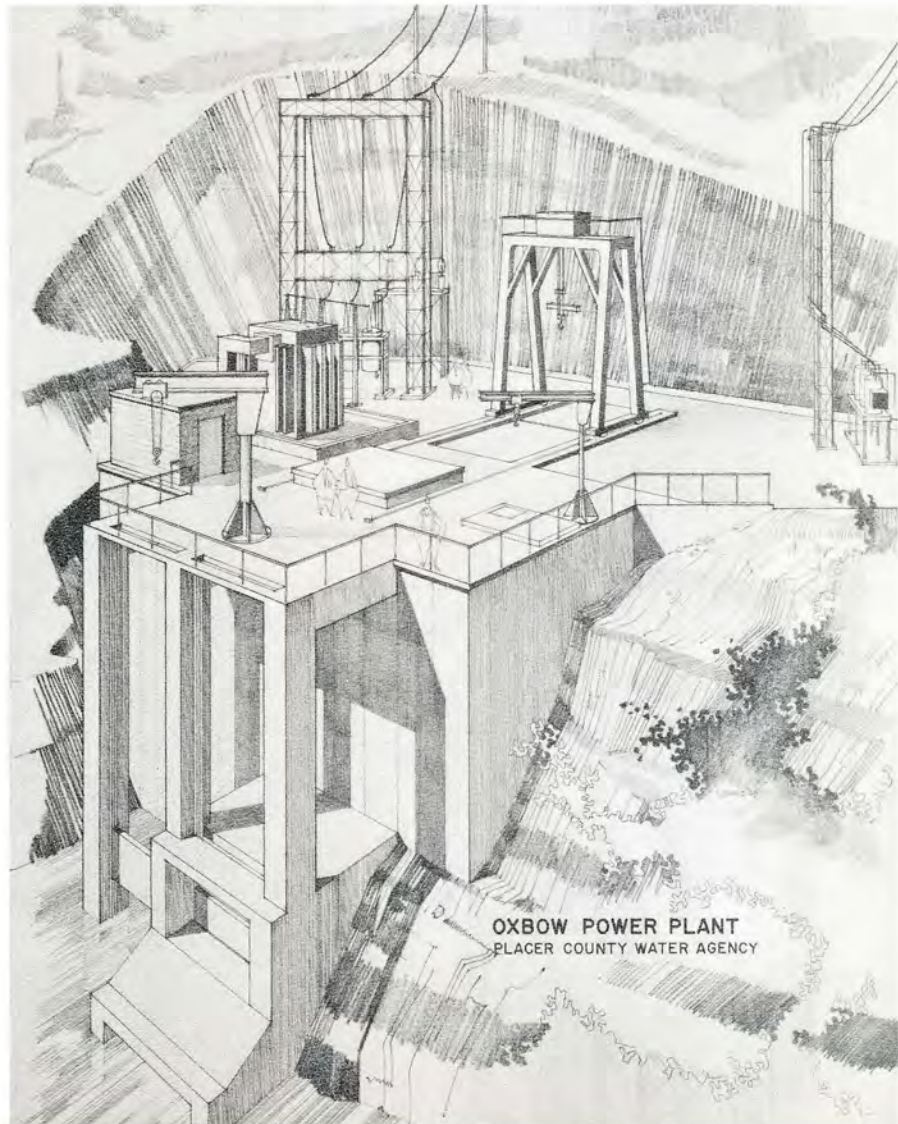
Switchgear in underground vault automatically transfers service to alternate source in the double radial system.

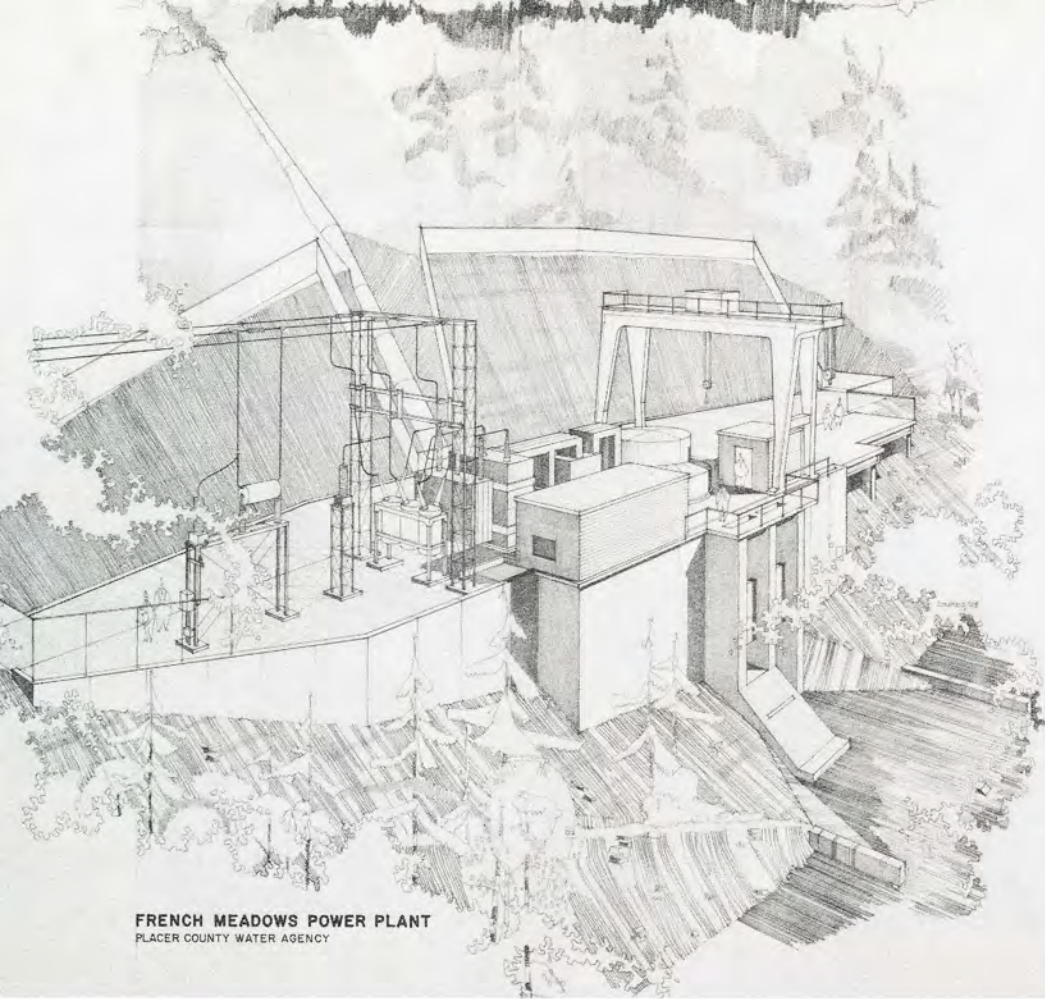


In addition to the automatic transfer system, a control permits manual switching of each building on the Capitol Mall from the preferred source to an alternate source.



Four powerhouses were designed for the American River Middle Fork project of the Placer County (California) Water Agency. The development includes a series of gravity diversions, reservoirs, tunnels and powerhouses, which will provide more than 325,000 acre-feet of storage and approximately 210,000 KW of electric power. Two of the power plants are the Ralston (sketched above) with installed capacity of 79,000 KW, and the Oxbow (right) 6,000 KW. CH2M designed the power houses and pump stations in association with McCreary-Koretsky Engineers, engineers and managers of construction for the entire project.





FRENCH MEADOWS POWER PLANT
PLACER COUNTY WATER AGENCY



Largest of the four power plants designed by CH2M for the American River Project of the Placer County Water Agency is the Middle Fork power plant, shown in sketch at right. It will have installed generating capacity of 110,000 KW. The French Meadows power plant (above) will have 15,300 KW capacity.

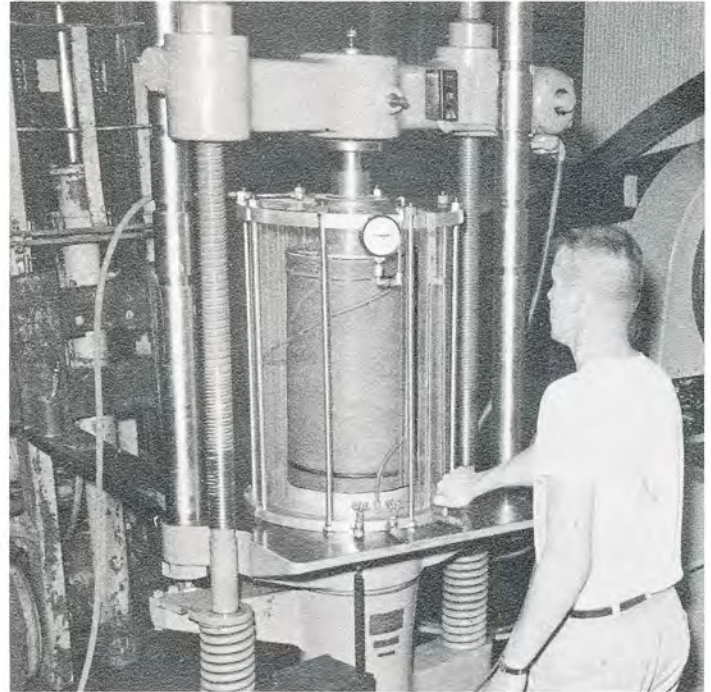


MIDDLE FORK POWER PLANT
PLACER COUNTY WATER AGENCY

SOILS INVESTIGATIONS



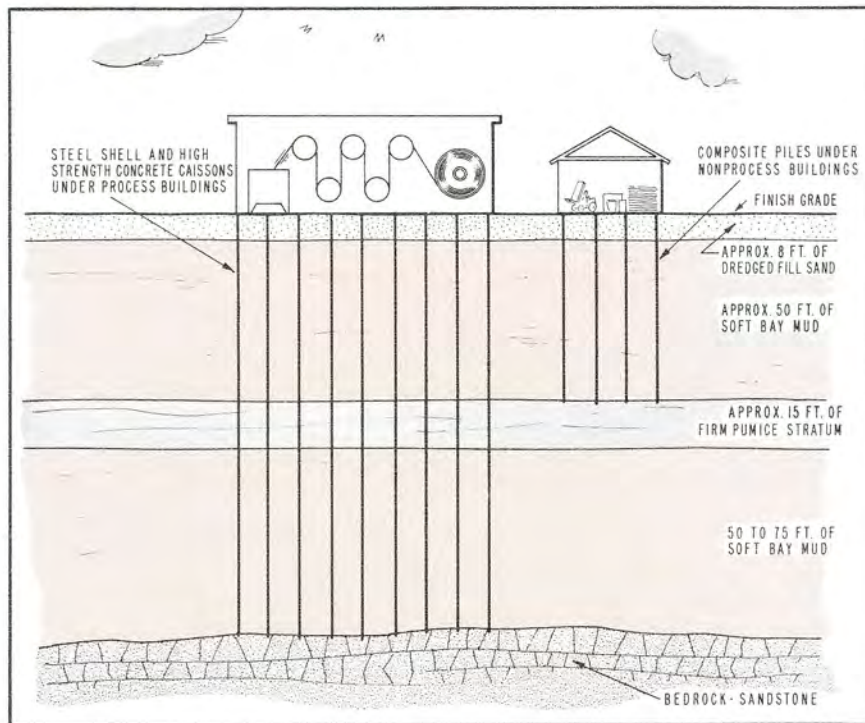
When a 240-foot section of a 56-foot high concrete retaining wall failed in Union Pacific's Portland yards, CH2M was retained by the railroad to determine the cause of failure.



In the Union Pacific wall failure investigation, special triaxial laboratory tests were made to determine strength of the backfill materials. Shown are the laboratory equipment (top) and the test sample, 12 inches in diameter, used in the tests to find the forces against the wall.



Soils investigations disclosed subsurface conditions which permitted dual foundation system for International Paper Company's new pulp and paper mill at Gardiner, Oregon. Sketch shows layer of firm pumice 15 feet down supporting piling for non-process buildings, while buildings housing heavy paper machines required steel shell and concrete caissons extending down 140 feet through soft bay mud to bedrock.



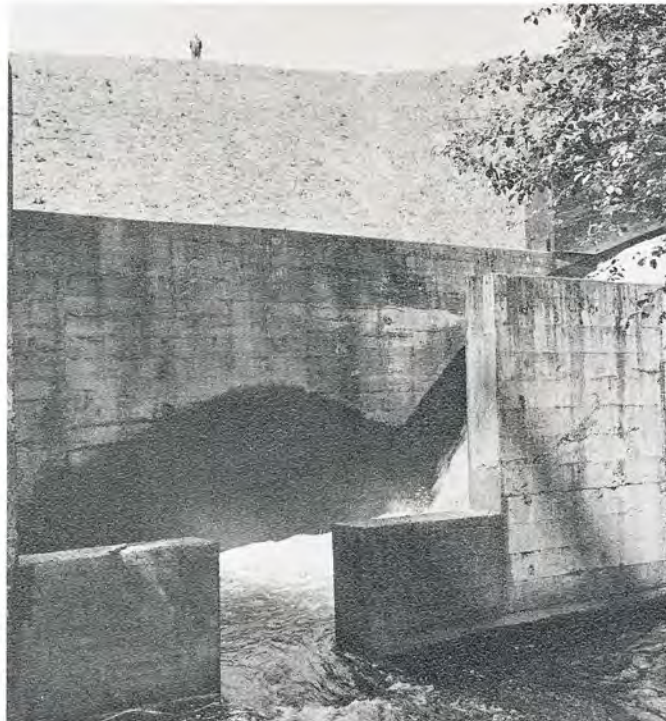


Oregon Forest Research Center at Corvallis, Oregon, is one of the many buildings for which foundation investigations have been made. James L. Payne, AIA.



Subsurface conditions required foundation piling 60 to 80 feet long under the new shopping center for Safeway Stores, Inc., Coos Bay, Oregon. Soils investigations showed continued consolidation of subsurface soft bay mud sediments was responsible for settlement problems in the area.

Foundation investigations and materials exploration were done for the Rock Creek Dam in the Coast Range, part of the water supply system for the City of Corvallis, Oregon. Tests were made to determine degree of compaction to make the earthfill dam impermeable, and the side slopes to make the dam stable.



Foundation studies for Olallie Dam provided for an initial structure 50 feet high and subsequent increase by 14 feet to provide storage for the water supply for Georgia-Pacific Corporation's large pulp and paper mill at Toledo, Oregon.

Field and laboratory investigations were made to determine shear strength and settlement characteristics of the soil down to depth of 30 feet to provide for design of footings for two 700-ton cement storage silos for Ideal Cement Company, Eugene, Oregon.





Soils investigation included both field and laboratory work to determine foundation requirements for Beth Kaiser Hospital, Portland, Oregon. Wolff & Zimmer, AIA.





Extensive exploratory drilling operations were included in advanced planning study of the Trask River hydroelectric project for the Tillamook Peoples Utility District, Tillamook, Oregon.

To prevent possible leakage, design of the foundation for the Rickreall Creek Dam for the City of Dallas, Oregon, required use of a concrete plug in a crevice in the bedrock under the channel. This 70-foot earthfill dam impounds 1100 acre-feet for the municipal water supply.



For the runways and taxiways at Kingsley Air Force Base, Klamath Falls, Oregon, a special test strip was laid for CBR tests of in-place strength of the materials in the base course.

MILITARY

Military airport projects include studies, design and construction supervision for apron and taxiway modifications at Portland Air Base for the USAF.

Runways and taxiways for Klamath Falls Air Base, 13th Naval District.





Bulk jet fuel storage for Klamath Falls Air Base, 13th Naval District.



Central heating plant for Klamath Falls Air Base, 13th Naval District.



COMMERCIAL BUILDINGS

Building for Central Lincoln PUD, Florence, Oregon.
Richard Sundeleaf, AIA.



Corvallis, Oregon, bank building for United States
National Bank. Mechanical and electrical design.
Jeppsen & Miller, AIA.



Bank of Idaho, Idaho Falls. Structural design for new bank building. Wayland, Cline & Smull, AIA.



Maintenance shop building for Marion County, Oregon. Mechanical, structural and electrical design for building, Donald W. Richardson, AIA.

Medford Branch, United States National Bank, Medford, Oregon. Mechanical and electrical design, including air conditioning. Robert J. Keeney, AIA.

Oak Hills Shopping Center, West Salem, Oregon. Mechanical and electrical engineering. Completely protected by automatic sprinkler system. James L. Payne, AIA.

Illaha Hills Country Club, Salem, Oregon. Heating, ventilating electrical and air conditioning installations. James L. Payne, AIA.





First Federal Savings & Loan,
Grants Pass, Oregon. Design of heating
and air conditioning for building.
Payne & Struble, AIA.



First Federal Savings and Loan,
Medford, Oregon. Design of heat and
air conditioning installations.
Robert J. Keeney, AIA.



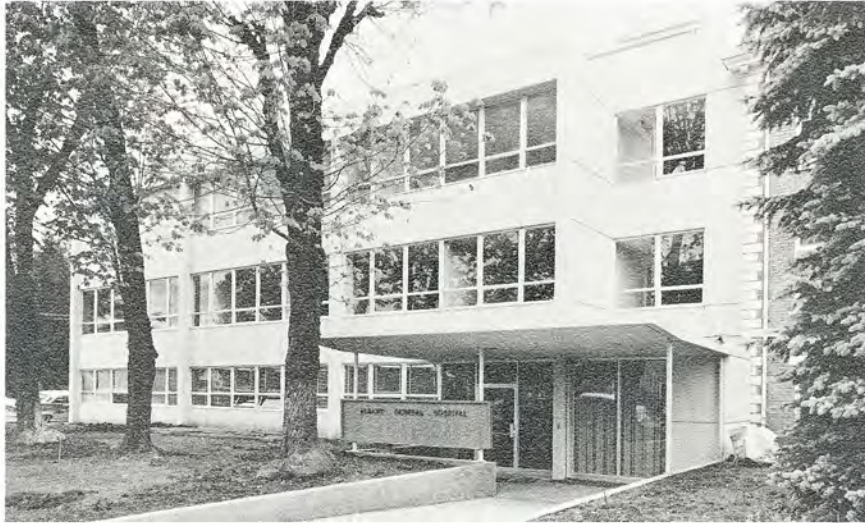
Salem Federal Savings and Loan.
Mechanical and electrical design for this
air conditioned building, which was
designed on a distinctive
diamond-shaped module.
James L. Payne, AIA.

Albany General Hospital, Albany, Oregon. Work included foundation investigations and structural, mechanical and electrical design for addition to this hospital. J. L. Payne, AIA.

Junior High School, Ashland, Oregon. Mechanical design for school building. Payne & Struble, AIA.

Good Samaritan Episcopal Church, Corvallis, Oregon. Mechanical, electrical and structural design for new church and parish hall. Jeppsen & Miller, AIA.

INSTITUTIONAL BUILDINGS





Willamette University Dormitory, Salem, Oregon. This project included mechanical, electrical and structural design and foundation investigations. J. L. Payne, AIA.



Hillside Junior High School, Boise, Idaho. Structural consulting and foundation investigations. Wayland, Cline & Smull, AIA.



Garfield School, Corvallis, Oregon. Mechanical and electrical systems were designed for this elementary school. Jeppsen & Miller, AIA.



Oregon State University, Corvallis, Oregon. Mechanical and electrical design for multiple-unit housing for married students. Jeppsen & Miller, AIA.

Willamette University Women's
Dormitory. Mechanical and electrical
design for building, which features a
stepped-roof design to accommodate
the sloping site. James L. Payne, AIA.

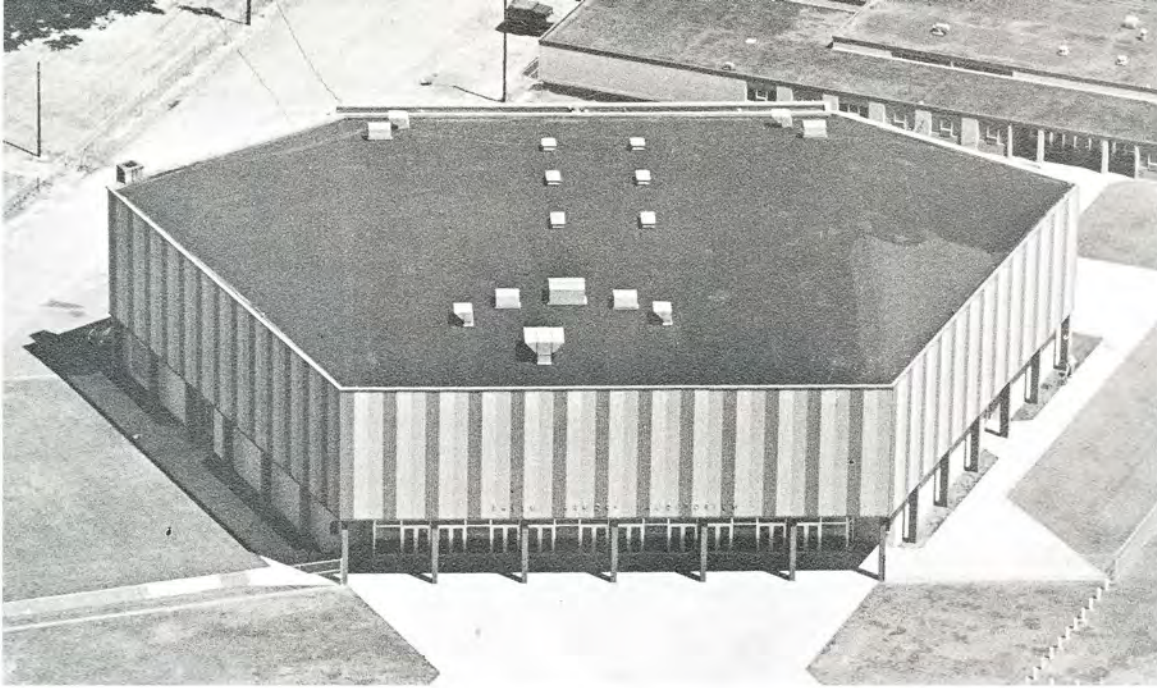


Federal Courts and Office Building,
Boise, Idaho. Structural design for this
building, which has distinctive wide
overhang at third floor level achieved
with a post-tensioned concrete
cantilever system. Hummel, Hummel,
Jones and Shawver, AIA, with
Charles Luckman Associates, AIA as
consulting architects.



Woodburn Junior High School,
Woodburn, Oregon. Full air conditioning
with air-to-water heat pump.
James L. Payne, AIA.





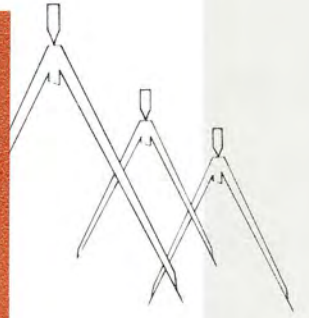
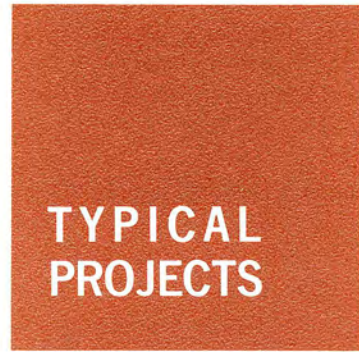
Armory-Auditorium, Salem, Oregon. An unusual design was utilized to provide a building which is used both as a civic auditorium and National Guard Armory. J. L. Payne, AIA.



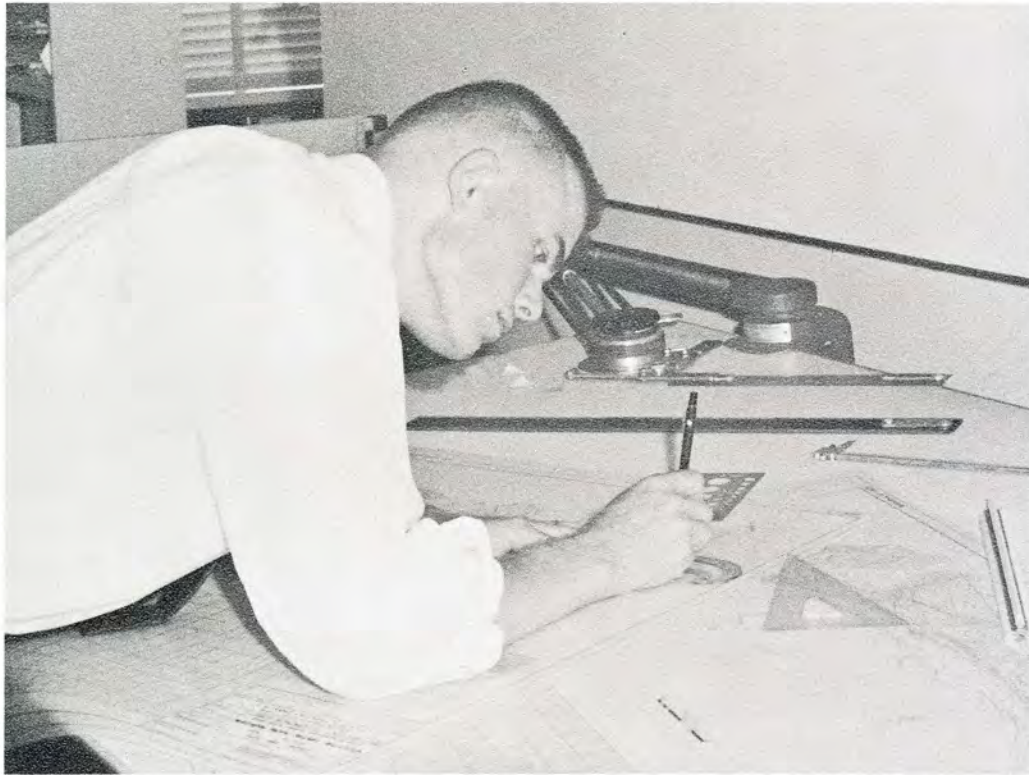
Salem Presbyterian Church, Salem, Oregon. Mechanical, electrical and structural design for educational wing which was added after main church building was moved to a new site. James L. Payne, AIA.



APPRAISALS



Establishing the value of utility or industrial property has great importance at times for tax, transfer of ownership, or adequacy of depreciation fund determination. CH₂M has undertaken a number of such appraisals, many of which have been accepted by the courts as the fair representation of property value. Whether the property to be appraised is large or small, the preparation of the inventory, its pricing, and depreciation proceeds with great attention to detail and accuracy so necessary in legal actions. CH₂M maintains a large staff of engineers of various disciplines well-qualified to direct the preparation of appraisals as well as to present and support the results before the proper tribunal.



WATER

Springfield municipal water system for the City of Springfield, Oregon.

Water utility properties in areas annexed by the City of Salem, for the City of Salem, Oregon.

Opal Springs Water Company properties for the Deschutes Valley Water District, Oregon.

Properties of the Jerome Water Company, Jerome, Idaho.

Properties of the Washington Waterworks Corporation, Washington.



ELECTRICAL SYSTEMS



Electric distribution properties in Union County, Oregon for the California-Pacific Utilities Company.

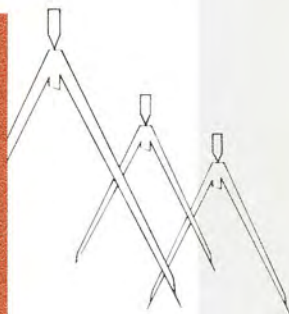
Tillamook County, Oregon, properties of the Pacific Power & Light Company, for the Tillamook County PUD.

Properties of the Shasta PUD in Redding, California for the Pacific Gas & Electric Company.

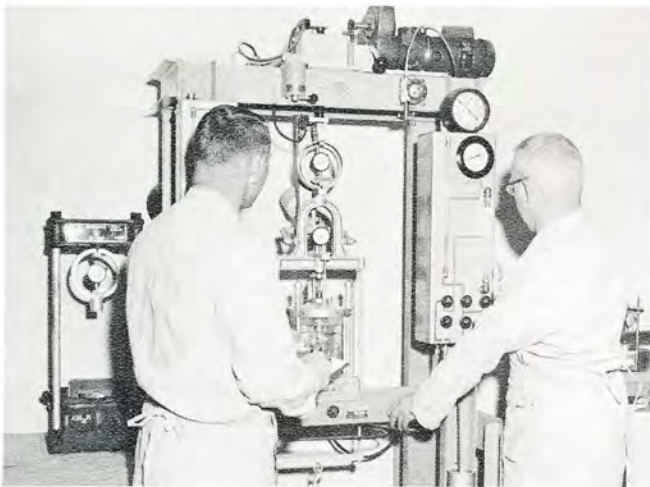
Pacific Power & Light Company properties in Milton-Freewater, Oregon, for the City of Milton-Freewater.



RESEARCH



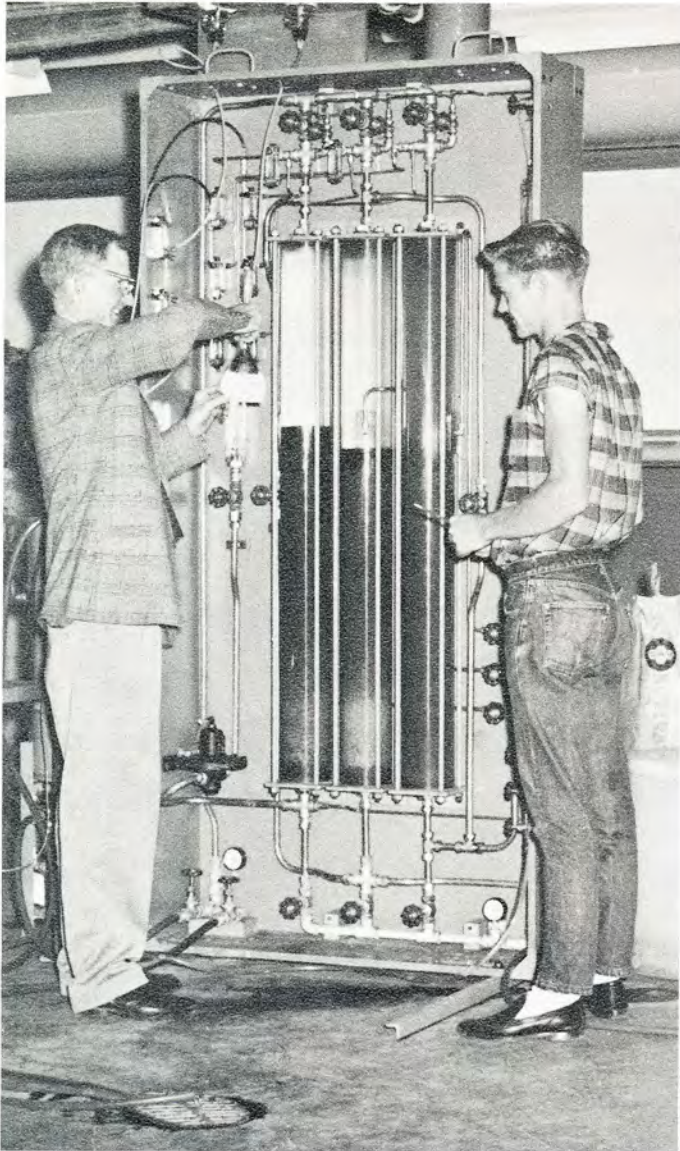
One of the by-products of working with others is knowledge of their problems and their need for new methods. It is quite natural, therefore, that research and development becomes a logical off-shoot of a forward-looking engineering organization. CH₂M has engaged in research and development from the first and has actually incorporated laboratory space in the last two building programs. As a result of these efforts to develop new, better, and less expensive approaches, CH₂M has contributed to equipment available in the control field; introduced the field of variable speed pumping and satisfactory controls and drives therefor; pioneered in the field of high-rate filtration and automation of the water purification process; developed new and better methods of promoting and controlling uniform digester temperature; undertaken basic research regarding separation of industrial wastes from water; and proposed and was first to utilize high specific speed pumps for trash handling. New methods are currently being developed in the water and waste fields which will permit future CH₂M projects to contribute in even greater measure to more beneficial use of our natural resources.



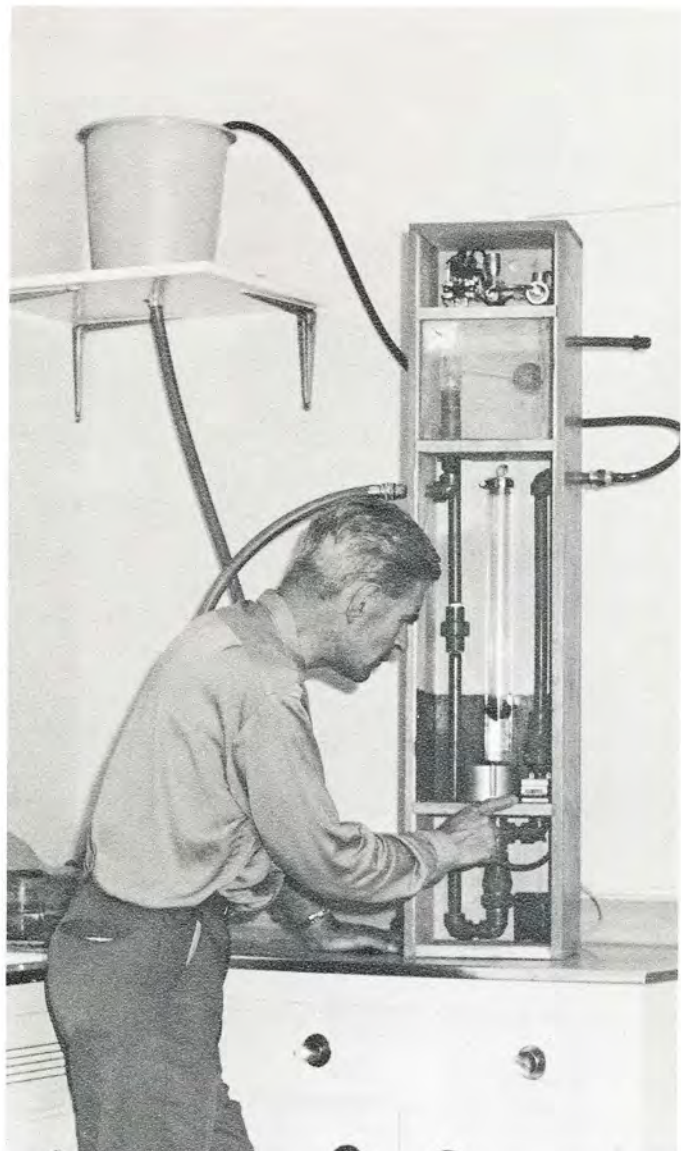


Testing a laboratory prototype of a turbidity monitoring and control instrument developed by CH₂M for application in the Pitcon water filtration process.

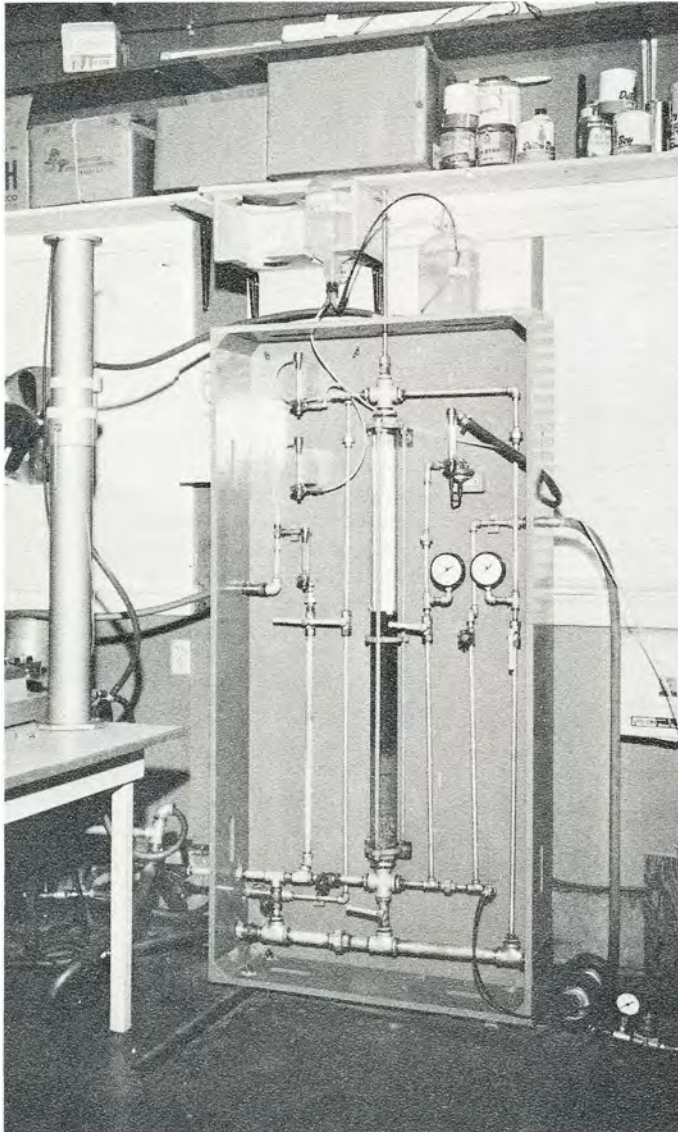




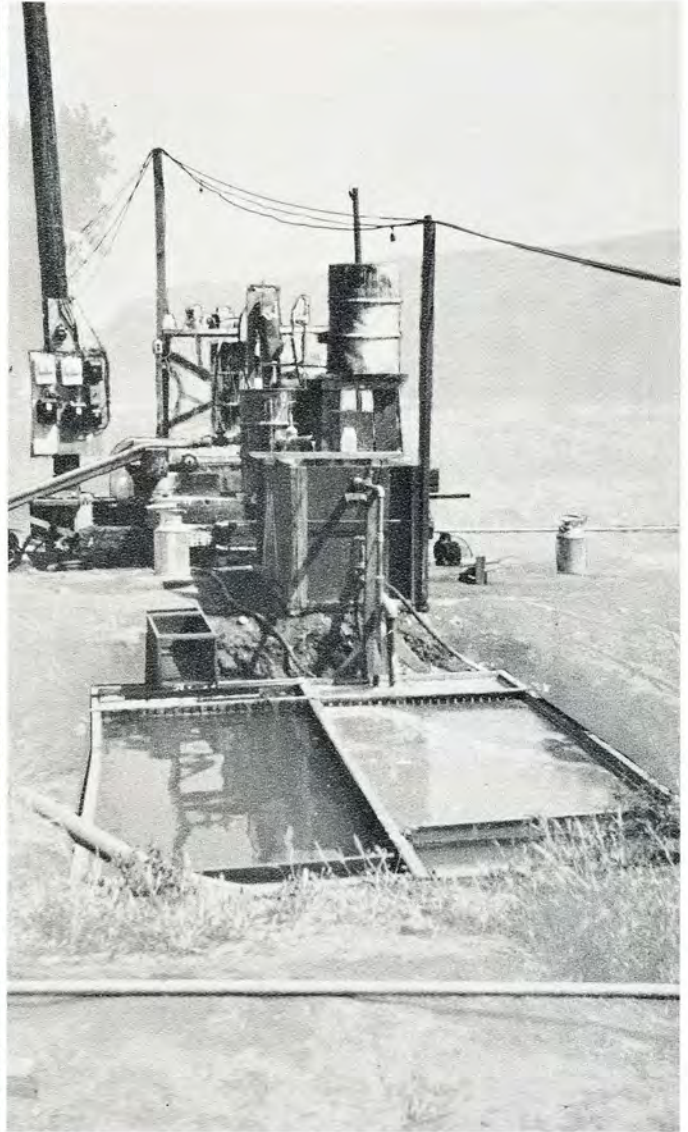
Periodical tests of product quality provide research and development group with information on a new chemical process.



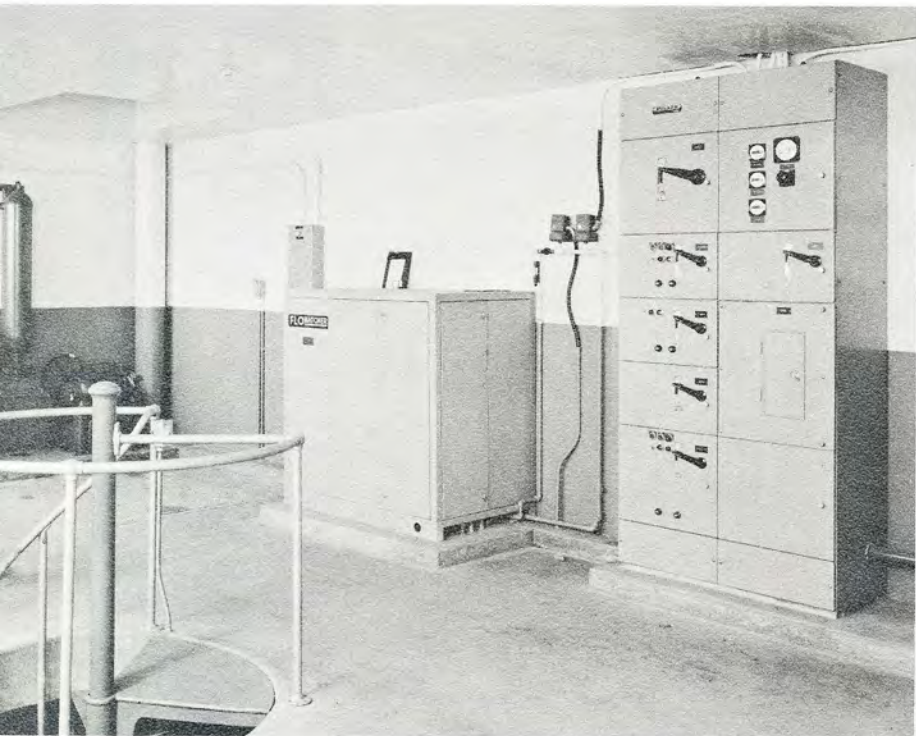
Applications of expanding technology to engineering designs lead to development of new equipment and new processes. Here a CH₂M development engineer checks the operation of an experimental pump model during tests.



This model of a filter was developed in research on the Pitcon process, an advance in water filtration which produces better quality water at lower installation and operating costs in comparison to conventional filtration systems.



Pilot plants are used to develop operating procedures and determine costs for treatment of special wastes. This pilot plant compared chemical precipitation to bio-chemical treatment of organic industrial wastes.



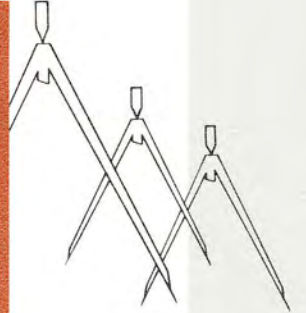
Control panel for the Flomatcher, a variable-flow pumping unit developed and patented by CH₂M. Output of the unit exactly equals the flow of the pump. It utilizes a wound rotor motor with the rotor circuit connected to a water rheostat. This device can be constructed to provide for pumping of a fixed or variable portion of the flow.



Design analysis model for a hydroelectric station. Models are extensively used as research and development tools, as aids in developing and designing plant layouts, hydraulic structures, pumping stations, and specialized equipment.



**PARTIAL LISTING
OF CLIENTS**



COMMERCIAL BUILDINGS

CLIENT

Albertson's Inc.
Boise, Idaho

Corvallis Gazette-Times
Corvallis, Oregon

Groom, Blanchard, Lamien
& McCollin, AIA
Salem, Oregon

Jeppsen & Miller, AIA
Corvallis, Oregon

Robert J. Keeney, AIA
Medford, Oregon

Pacific Northwest Bell Telephone Co.
Portland, Oregon

James L. Payne, AIA
Salem, Oregon

Payne & Struble, AIA
Medford, Oregon

Safeway Stores
Portland, Oregon

R. Sundeleaf, AIA
Portland, Oregon

Wayland, Cline & Smull, AIA
Boise, Idaho

PROJECT

Various supermarket buildings in Utah, Idaho, Oregon, Washington (soils investigation, structural design, consultation).
Design pressroom ventilation system, press foundations.

Pacific Northwest Bell Telephone Co., POC building, Salem, Oregon (mechanical, electrical, soils, foundation).

First Federal Savings & Loan, Albany, Oregon, (mechanical and electrical); U. S. National Bank buildings in Stayton, Oregon, and Corvallis, Oregon (mechanical, electrical & structural).

Medford building for U. S. National Bank of Oregon (mechanical and electrical).

Buildings (soils and foundations).

Office building and parking garage, Salem Title Co. (mechanical, electrical, structural, foundations); Oak Hills Shopping Center, Salem, Ore., and Santiam Shopping Plaza, Sweet Home, Ore. (mechanical and electrical).

First Federal Savings & Loan building, Grants Pass, Oregon (mechanical).

Various store locations (soils and foundations).

Headquarters building for Central Lincoln PUD, Florence, Oregon.

Bank of Idaho buildings at Boise, Idaho Falls, and Sandpoint, Idaho (structural design). Office building for Mutual of New York, Boise, Idaho (structural design). Retail sales building for Skaggs Drug Co., Boise, Idaho (structural design).

COMMUNITY PLANNING AND RECREATION

CLIENT

Boardman, Oregon, City of

Corps of Engineers
Walla Walla District

Dropping, Kelly & Finch, AIA
Boise, Idaho

Dropping & Kelly, AIA
(Formerly Victor N. Jones & Associates).
Boise, Idaho

Eugene Water & Electric Board, Oregon

Clair A. Hill & Associates
Redding, California

Idaho Falls, Idaho, City of

Cecil Jones, AIA
Twin Falls, Idaho

First Methodist Church
Corvallis, Oregon

McMinnville, Oregon, City of

Milton-Freewater, Oregon, City of

James L. Payne, AIA
Salem, Oregon

Port of Umpqua and Douglas County, Oregon

Reedsport, Oregon, City of

Roseburg, Oregon, City of

F. & L. Stubblefield
Ukiah, Oregon

Williams & Martin, AIA
Portland, Oregon

PROJECT

Relocation of complete city which will be flooded by John Day Dam project.

Indoor swimming pool and theater.

Bogus Basin ski lodge (structural design).

Additions to Memorial Gymnasium (structural design).

Fish spawning facilities on McKenzie River.

NCO Club at Beale AFB.

Municipal swimming pool.

NCO Club at Mt. Home AFB.

Recreation center.

Municipal swimming pool.

Municipal swimming pool.

Salem Auditorium-Armory.

Plan for development of sports and commercial fishing facility.

Municipal swimming pool.

Modifications to existing municipal swimming pool.

Lehman Hot Springs recreation area planning.

Swimming pool for Tualatin Hills Park and Recreation Board.

ELECTRICAL DISTRIBUTION AND TRANSMISSION

CLIENT

Bandon, Oregon, City of
Bonneville Power Administration

Eugene Water & Electric Board, Oregon

Forest Grove, Oregon, City of
Clair A. Hill & Associates
Redding, California

Idaho Falls, Idaho, City of

Jeppsen & Miller, AIA
Corvallis, Oregon

McMinnville, Oregon, City of
Milton-Freewater, Oregon, City of
Myrtle Creek, Oregon, City of
State of Oregon

Paul Electric Company,
Paul, Idaho

Salem, Oregon, City of
Tillamook County PUD, Oregon
Wahkiakum County PUD, Washington

PROJECT

Studies and designs for distribution system.
Substations at Oregon City, Oregon; Port Townsend, Washington;
Chemawa, Oregon; Springfield, Oregon.

115-kv transmission line studies.

Studies and designs for distribution system.
69-kv transmission line for Surprise Valley REA, California.

Substation design; design of system voltage conversion; and
complete study of entire electric distribution system.

12-kv underground distribution system (power and TV)
for Oregon State University.

Studies and designs for distribution system.

Studies and designs for distribution system.

Studies and designs for distribution system.

Underground distribution system for State Capitol Mall,
Salem, Oregon.

Study of distribution system for electric company serving City of Paul
and environs.

Study of compliance with safety code by utilities.

Studies and designs for distribution system.

Studies and designs for distribution system.

GENERAL CONSULTING

CLIENT

Baker, Oregon, City of
Bank of California

Bureau of Commercial Fisheries,
U. S. Department of Interior

Capitol Investment Company
Portland, Oregon

Corps of Engineers
Portland District, Oregon

General Insurance Company

Green Construction Company
and Tecon Corporation
Seattle, Washington

Idaho Falls, Idaho, City of
Idaho Public Utilities Commission

Thomas A. Jacobs,
Corvallis, Oregon

Peter Kiewit Sons' Company
Portland, Oregon

Oregon State Game Commission

Pacific Gas & Electric Company
Pacific Power & Light Co.

Tillamook County PUD, Oregon

Union Pacific Railroad

Zurich Insurance Company
Seattle, Washington

PROJECT

Consultation, water rate schedules.

Property use study, Eugene, Oregon.

Design of fish testing facilities on Grande Ronde River.

Study industrial land use.

Fallout shelter surveys.

Investigation of cause of failure, Middleton Bridge, Idaho.

Study of soils for Corps of Engineers, Hills Creek Dam project,
Middle Fork Willamette River, Oregon.

Investigation, cost of purchased electric energy.

Consultation, costs of industrial electric service;
rate case consultation service in water and electric rate cases.

Property use and economic study of city block.

Preblast inspections.

Study of fish screening facilities for Willamette River at Oregon City.

Appraisal of power system property.

Accident investigations.

Study, appraise, determine feasibility of purchase of
Pacific Power & Light Company properties in Tillamook County.

Study of soils, foundations and structural design of
failed retaining wall, Portland Albina yards.

Miscellaneous investigations.

INDUSTRIAL PLANTS AND PROCESSES

CLIENT

Boeing Company
Seattle, Washington

Corps of Engineers
Seattle District

Eugene Water & Electric Board, Oregon

Evans Products Company
Coos Bay, Oregon

Clair A. Hill & Associates
Redding, California

International Paper Company
Gardiner, Oregon

Medford Corporation
Medford, Oregon

Menasha Corporation
North Bend, Oregon

Modern Freezing & Storage Inc.
Corvallis, Oregon

Oregon Metallurgical Corporation
Albany, Oregon

James L. Payne, AIA
Salem, Oregon

Port of Benton, Washington

Publishers' Paper Company
Oregon City, Oregon

Wah Chang Corporation
Albany, Oregon

Wayland, Cline & Smull, AIA
Boise, Idaho

Willamette Iron & Steel Corporation
Portland, Oregon

PROJECT

Foundation investigation at Boardman, Oregon.

Cold storage plant.

Design of sawdust conveyor. Design of steam lines.

Consultation, process steam usage problem.

Paracargo building for U. S. Forest Service.
Process water cooling system for Calaveras Cement Company.

Foundation investigation, paper mill site, Gardiner, Oregon.

Studies of steam and fuel requirements.

Site studies, site preparation for pulp and paper mill,
causeway and bridge for access road.

Freezing and cold storage plant.

Siting and design of plant, laboratory and office building.

Dairy and creamery building for Hofstetter, Inc.

Preliminary design of meat packing plant.

Design barge for sulphite liquor transport.

Fuel handling system; hazardous chemical building
and process water treatment.

Cannery, cold storage building for State of Idaho at Nampa
(structural design). Maintenance shops for Idaho Department of
Highways at Rigby and Boise, Idaho (structural).

Storage for liquid oxygen and nitrogen (structural design).

MILITARY

CLIENT

Air Defense Command
United States Air Force

Corps of Engineers
Seattle District

Corps of Engineers
Walla Walla District, Washington

Clair A. Hill & Associates
Redding, California

13th Naval District
Seattle, Washington

Orr Pickering & Associates, AIA
Billings, Montana

PROJECT

Runways and taxiways reconstruction, aircraft maintenance
degreasing facility, McChord AFB. Runway and taxiways and apron
reconstruction, Kingsley Field, Klamath Falls. Apron reconstruction,
Portland Air Base. Heating system revisions for radar stations
at eight locations.

RA Special Facility (Bomarc); cold storage plant, Adair Air Force Station.

Aircraft maintenance shop, armament and electronic shop, fire station,
theater, operations squadron building, training building, indoor
swimming pool, utilities, taxiways and aprons, water, sewers, streets,
electricity, RAPCON center, parking apron (electrical and storm
sewer), high-temperature water heating plant and distribution system,
steam boiler plant, air condition Target Intelligence Training Building,
Mt. Home AFB, Gowen Field POL. Central heating system and boiler
plant, ammunition disassembly and renovation,
Umatilla Ordnance Depot.

FPS radar facility (mechanical and electrical), Red Bluff AFB.
1250-unit Capehart housing development (mechanical and electrical),
on-site and off-site electrical distribution systems, master TV system,
NCO club building (mechanical and electrical), Beale AFB.

Alert hangar, flight simulator training building, ready rocket storage
building, ammunition igloo, jet test cell, central heating plant and
distribution system, bulk jet gas storage, navigational aid facilities,
extension of utilities, taxiways lighting, paving of apron and warmup
pad, runways, aprons, taxiways, Kingsley Field, Oregon.

Fallout shelter design for Keno AFS.

Airmen's dormitories, communications building (mechanical),
Glasgow AFB. Auto maintenance shops (mechanical), Malmstrom AFB.

POWER

CLIENT

Bate Lumber Company
Merlin, Oregon
Centralia, Washington, City of
Elk Lumber Company
Medford, Oregon
Eugene Water & Electric Board,
Eugene, Oregon

Idaho Falls, Idaho, City of
McCreary-Korestsky Engineers
San Francisco, California
Menasha Corporation,
Paperboard Division
North Bend, Oregon
Milton-Freewater, Oregon, City of
Sandwell International Engineers
Vancouver, British Columbia
Tillamook County PUD, Oregon
Willamette National Lumber Company
Foster, Oregon

PROJECT

Steam power plant.
Powerhouse supervisory control.
Steam power plant and later expansion.

Walterville project, McKenzie River. Preliminary design
Beaver Marsh project, McKenzie River. Study hydroelectric
development of McKenzie River and Santiam River.
Preliminary studies for Carmen-Smith hydroelectric project.
Powerhouse supervisory control and power rate studies.
Four powerhouses for Placer County Water Agency,
American River project, California.
Boiler plant operation and expansion.

Conversion of existing generating facilities for peaking operations.
Consultants on Homathko hydroelectric project for
British Columbia Power Commission.
Trask River hydroelectric development.
Boiler plant modernization. Design of draft system, air heaters
and controls.

PUBLIC AND INSTITUTIONAL BUILDINGS

CLIENT

Capitol Manor, Inc.
Salem, Oregon
Dropping, Kelly & Finch, AIA
Boise, Idaho

Eugene, Oregon, City of
Hummel, Hummel, Jones & Shawver, AIA
Boise, Idaho
Jeppsen & Miller, AIA
Corvallis, Oregon

Robert J. Keeney, AIA
Medford, Oregon

LaGrande Public Schools
LaGrande, Oregon
Martin & Hawkes, AIA
Salem, Oregon
James L. Payne, AIA
Salem, Oregon

Payne & Struble, AIA
Medford, Oregon
Donald W. Richardson, AIA
Salem, Oregon
Wayland, Cline & Smull, AIA
Boise, Idaho
Wolfe & Zimmer, AIA
Portland, Oregon

PROJECT

High rise retirement home (soils and foundation).

Dormitory and physical sciences building for University of Idaho
(structural design). Latah County Court House (structural).
Agricultural research laboratory for U. S. Dept. of Agriculture,
Twin Falls, Idaho.
Foundation studies for new City Hall.
Federal Office Building, Boise (structural design).
Post Office additions, Nampa and Caldwell, Idaho (structural).
Various elementary schools (mechanical and electrical)
for School District 509cj. Infirmary addition for Oregon State
University. Church of the Good Samaritan (mechanical and electrical),
Corvallis, Oregon. Married student housing (mechanical and electrical)
for Oregon State University. Oceanography Building, Oregon State
University (mechanical and electrical).
High school (mechanical) for School District No. 6,
Jackson County, Oregon. Dormitory-Dining Hall complex,
Southern Oregon College, Ashland, Oregon.
Investigation of school buildings (structural and mechanical).
Supreme Court Building (electrical renovation).
Salem General Hospital addition (mechanical, electrical and
foundation). Salem Memorial Hospital (mechanical, electrical and
foundation). Willamette University, men's and women's dormitories,
science building addition (mechanical, electrical, structural).
Eagle Point, Oregon High School (mechanical).
Marion County shop buildings (mechanical, electrical, structural).
Residential center, cafeteria, fallout shelter, University of Idaho
(structural).
Bess Kaiser Hospital (foundation).

RIVERS, PORTS AND WATERFRONTS

CLIENT

Commission of Public Docks
Portland, Oregon

Douglas County, Oregon

Oregon State University
Corvallis, Oregon

The Port of Coos Bay

The Port of Portland Commission
Portland, Oregon

The Port of Umatilla, Oregon

PROJECT

Study for two modern deep-draft general cargo berths plus long-range planning for future expansion; study to determine economics and physical practicability of use of former Oregon Shipbuilding Corporation yard in expansion of harbor facilities.

Harbor development, Winchester Bay, Oregon.

Study for marine laboratory sites on Yaquina River and two locations for docking vessels of Oceanography Department, Yaquina Bay, Oregon. Design of causeway and dock at marine sciences laboratory.

Study expansion of Charleston Harbor. Study feasibility of main channel improvement.

Industrial area planning.

Development for bulk handling facilities.

ROADS, STREETS, RAILROADS AND BRIDGES

CLIENT

Baker, Oregon, City of

Corps of Engineers
Walla Walla District

Fremont County, Idaho

Georgia-Pacific Corporation
Portland, Oregon

Idaho Falls, Idaho, City of

Nyssa, Oregon, City of

Pasco, Washington, City of

Pope and Talbot Lumber Co.
Oakridge, Oregon

Twin Falls, Idaho, City of

Umpqua River Navigation Co.
Reedsport, Oregon

PROJECT

Arterial and residential streets, Powder River Bridge.

Relocation of Northern Pacific Railroad, Lower Monumental Dam on Snake River. Relocation of Union Pacific Railroad, Ice Harbor Dam on Snake River.

Secondary highways, Teton River Bridge.

660-foot span suspension bridge for steam and chip lines at Toledo, Oregon.

Sewer line suspension bridge, street program.

Street program.

Street program.

Highway grade separation structure.

Arterial street design.

Railroad connection to Long-Bell Lumber Co., Gardiner, Oregon, three miles of railroad including two river crossings and highway grade separation.

SOILS INVESTIGATION SERVICES

CLIENT

Nat Adams, AIA
Boise, Idaho

David F. Bates
Salem, Oregon

The Boeing Company
Seattle, Washington

Corvallis, Oregon, City of

Dallas, Oregon, City of

Eugene, Oregon, School District

Eugene Water & Electric Board
Eugene, Oregon

Freeman, Hayslip, Tuft & Hewlett, AIA
Portland, Oregon

Hummel, Hummel, Jones & Shawver, AIA
Boise, Idaho

International Paper Co.
Gardiner, Oregon

Chris Jeppsen, AIA
Corvallis, Oregon

PROJECT

Council Hospital, Council, Idaho (foundation study).

Capitol Manor Apartments, Salem, Oregon (foundation study).

Rocket test stand, Boardman, Oregon (foundation study).

Rock Creek Dam, water supply.

Water storage dam.

Four schools (foundation studies).

Carmen-Smith Project (study).

The First National Bank, Corvallis, Oregon (foundation study).

Post Office addition, Caldwell Idaho; and Federal Building, Boise, Idaho, for General Services Administration (foundation studies).

Paper mill (soils investigation).

Jefferson School, Corvallis (foundation study).

SOILS INVESTIGATION SERVICES (Continued)

CLIENT

Lincoln County School District
Newport, Oregon
McMinnville, Oregon, City of
Pacific Northwest Bell Telephone Company
Portland, Oregon
James L. Payne, AIA
Salem, Oregon

Safeway Stores, Inc.
Construction Division
Portland, Oregon

C. Ed Trout
Boise, Idaho

Union Pacific Railroad
Portland, Oregon

U. S. Air Force:
Kingsley Field, Oregon
McChord Field, Washington
Portland AFB, Oregon

Wayland, Cline & Smull, AIA
Boise, Idaho

Wolfe & Zimmer, AIA
Portland, Oregon

PROJECT

Three schools (foundation studies).

Nestucca and Walker Creek Dams (study).

Six locations (foundation studies).

Oregon Forest Research Laboratory, Corvallis, Oregon;
Armory-Auditorium, Salem, Oregon; Albany General Hospital,
Albany, Oregon; Salem General Hospital and Salem Memorial Hospital,
Salem, Oregon; dormitories, Willamette University; and dormitories,
Oregon College of Education (all foundation studies).

Ten locations (foundation studies).

Albertson's Stores, Inc., Boise, Idaho, retail stores:
five locations (foundation studies).

Investigation of retaining wall failure.

Runways and taxiways.
Runways and taxiways.
Operational apron.

Imperial Plaza Apartments, Boise, Idaho (foundation study).

Bess Kaiser Hospital, Portland, Oregon (foundation study).

WASTE DISPOSAL

CLIENT

Albany, Oregon, City of

Alpenrose Dairy
Portland, Oregon

Aluminum Company of America
Vancouver, Washington

Baker, Oregon, City of

Bench Sewer District
Boise, Idaho

Bingen, Washington, City of

Burley, Idaho, City of

Caldwell, Idaho, City of

Camas, Washington, City of

Cannon Beach, Oregon, City of

Canyonville, Oregon, City of

Clarkston, Washington, City of
Corvallis, Oregon, City of

Crown-Willamette Paper Co.
West Linn, Oregon

Crown Zellerbach Paper Co.
Camas, Washington

Eugene, Oregon, City of

Federal Housing Administration
Roseburg, Oregon

Forest Grove, Oregon, City of

R. T. French Company
Shelley, Idaho

PROJECT

Sewers and sewage treatment.

Dairy waste treatment.

Sewers and sewage treatment.

Sewers and sewage treatment.

Sewers and sewage pretreatment station.

Sewers and sewage treatment.

Sewers and sewage treatment.

Sewers and sewage treatment.

Sewers and sewage treatment.

Sewers and sewage treatment.

Sewers and sewage treatment.

Sewers and sewage treatment studies.

Sewers and sewage treatment.

Sulphite waste liquor lagoon.

Sulphite waste liquor lagoon.

Sewers and sewage treatment.

Sewers and sewage treatment

Sewers and sewage treatment.

Potato waste treatment.

WASTE DISPOSAL (Continued)

| CLIENT | PROJECT |
|--|--|
| Frontier Leather Company Sherwood, Oregon | Tannery waste treatment. |
| General Foods Inc., Birdseye Division Nampa, Idaho | Cannery waste pretreatment. |
| Georgia-Pacific Paper Co. Toledo, Oregon | Waste treatment study; ocean outfall and odor control study. |
| Grants Pass, Oregon, City of | Sewers and sewage treatment. |
| Harrisburg, Oregon, City of | Sewers and sewage treatment. |
| Idaho Falls, Idaho, City of | Sewers and sewage treatment. |
| Lebanon, Oregon, City of | Sewers and sewage treatment. |
| McMinnville, Oregon, City of | Sewers and sewage treatment. |
| Medford, Oregon, City of | Sewers and sewage treatment. |
| Menasha Corporation North Bend, Oregon | Waste disposal study. |
| Normandy Park, Washington, City of | Sewers and sewage treatment. |
| Northwest Boise Sewer District Boise, Idaho | Sewers and sewage treatment studies. |
| Ontario, Oregon, City of | Sewers and sewage treatment. |
| Oregon Pulp & Paper Company Salem, Oregon | Sulphite waste liquor lagoon. |
| Pasco, Washington, City of | Interceptor, sewer and pump station. |
| Pendleton, Oregon, City of | Pilot plant study and design, pea cannery waste. Sewers and sewage treatment. |
| The Pillsbury Company Grand Forks, North Dakota | Potato waste treatment. |
| Placerville, California, City of | Sewers and sewage treatment. |
| Rainier, Oregon, City of | Interceptor and sewage treatment. |
| Raymond, Washington, City of | Sewers and sewage treatment. |
| Rexburg, Idaho, City of | Sewers and sewage treatment. |
| Rogers Brothers Company Idaho Falls, Idaho | Potato waste treatment. |
| Roseburg, Oregon, City of | Sewers and sewage treatment. |
| Salem, Oregon, City of | Sewers and sewage treatment. |
| Silver Falls Packing Company Portland, Oregon | Meat process wastes. |
| J. R. Simplot Burley, Idaho | Potato waste treatment. |
| South Suburban Sanitary District Klamath Falls, Oregon | Sewers and sewage treatment. |
| Springfield, Oregon, City of | Sewers and sewage treatment. |
| Stayton Canning Company Stayton, Oregon | Irrigation disposal. |
| Tillamook Creamery Association Tillamook, Oregon | Milk and cheese waste, study. |
| Troutdale Wool Pullery Troutdale, Oregon | Pullery waste, study |
| United Growers, Inc. Salem, Oregon | Cannery waste, study. |
| U. S. Navy, Bureau of Yards and Docks Seattle, Washington | Sewers. |
| Willamette Poultry Company Creswell, Oregon | Treatment pond. |
| Winston, Oregon, City of | Sewers and sewage treatment plants. |
| Yakima, Washington, City of | Domestic and industrial waste treatment facilities. |

WATER CONTROL AND IRRIGATION

CLIENT

Clarkston, Washington, City of
Corps of Engineers,
U. S. Army
Eugene, Oregon, City of
Grants Pass, Oregon, City of
Idaho Falls, Idaho, City of
Lacomb Irrigation District, Oregon
Medford, Oregon, City of
Ontario, Oregon, City of
United Growers, Inc.
Salem, Oregon
U. S. Soil Conservation Service

Weiser Irrigation District
Weiser, Idaho

PROJECT

Comprehensive storm sewer studies.
Flood control studies, Boise River, Idaho, and John Day River, Oregon.

Comprehensive storm sewer studies.
Comprehensive storm sewer studies.
Comprehensive storm sewer studies.
Flume replacement study.
Storm sewer planning.
Study and design of storm sewer system.
Irrigation disposal.

Pumping station and protective dike for Lake Labish Water Control District, Salem, Oregon.
Design of hydraulic structures.

WATER SUPPLY AND DISTRIBUTION

CLIENT

Atomic Energy Commission
Baker, Oregon, City of
Boise Water Corporation
Boise, Idaho
Caldwell, Idaho, City of
Centralia, Washington, City of
Corvallis, Oregon, City of

Dallas, Oregon, City of

Eugene Water & Electric Board
Eugene, Oregon
Georgia-Pacific Corporation
Portland, Oregon
Grants Pass, Oregon, City of
Hermiston, Oregon, City of
Idaho Falls, Idaho, City of
Junction City, Oregon, City of
Juneau, Alaska, City of
LaGrande, Oregon, City of
Lynden, Washington, City of
Medford Water Commission
Medford, Oregon
Menasha Corporation
North Bend, Oregon
Newport, Oregon, City of
Ontario, Oregon, City of
Parkrose Water District
Portland, Oregon
Pasco, Washington, City of
Pendleton, Oregon, City of
Richland, Washington, City of

PROJECT

Filter plants at Hanford project.
Dam, reservoir, transmission and distribution lines.
Long-range plans for water facilities expansion.
Design of concrete reservoirs.
Long-range plans for water facilities expansion.
Distribution system expansion.
Water treatment plant, impounding storage, transmission lines and distribution storage.
Dam and storage reservoir, pump station, supply pipeline, distribution reservoirs.
Water distribution reservoirs, treatment plant expansion, distribution and storage studies.
Salt water barrier, water supply dam and pipeline at Toledo, Oregon.

Plant expansion.
Water system study.
Wells, treatment facilities, transmission lines, supervisory controls.
Pumping station and reservoir.
Water supply and distribution system.
Long-range plans for water facilities expansion.
Intake, treatment plant and distribution system expansion.
Long-range plans for water facilities expansion, distribution study.

Water supply studies for paper mill.

Earthfill supply dam, treatment plant.
Wells, pumping station and reservoir.
Supply development, distribution system and storage reservoirs.

Supply and plant expansion, distribution system and storage.
Long-range plans for expansion of water facilities.
Supply pipelines, treatment plant, distribution storage reservoir, supervisory control system.

