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1974 ANNUAL REPORT 1975
HETCH HETCHY WATER AND POWER
PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO

CITY AND COUNTY OF SAN FRANCISCO

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ANNUAL REPORT
FISCAL YEAR 1974-75

HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to Hetch Hetchy employees, past and present, whose devoted and conscientious efforts have made possible these accomplishments for San Francisco.



LAKE ELEANOR AND LAKE
LLOYD/CHERRY DAM (foreground)

HIGHLIGHTS - 1974-75

For Hetch Hetchy, fiscal year 1974-75 has been a record year in many ways. The heavy rainfall and snow on the Tuolumne River Watershed during the past two years have brought higher-than-normal inflows. With all project reservoirs assured of filling and spilling, our efforts were bent on channeling the maximum available water for electric power production and on minimizing spill after the reservoirs have been filled. The success of these efforts is shown by department's electric system output of 2,057,609,000 kilowatthours for 1974-75, a new record for total project hydroelectric generation for one fiscal year.

During the year, Hetch Hetchy furnished 588,989,569 kilowatthours to seven industrial customers located in Alameda, Santa Clara and Stanislaus Counties, for a revenue of \$7.9 million. Both sales and revenue represent records unmatched in Hetch Hetchy's history. The impact of the revenue becomes even more dramatic when it is shown that the same number of kilowatthours sold to these customers in fiscal year 1969-70 would have returned little more than half as much revenue.

The record generation and the high industrial power rates combined have boosted the department's total revenue from sale of electric energy to a new high of \$18.5 million in 1974-75, an increase of \$4.5 million over the last fiscal year. Compared with the previous high of \$15.0 million for fiscal year 1970-71, the increase is still a sizable \$3.5 million.

Surplus earnings enabled the department to make available \$1.0 million to the City's general fund in 1974-75, hopefully marking the beginning of many such contributions.

Negotiations to extend the March 14, 1945 "Main Contract" between PGandE and City beyond the expiration date of July 31, 1975 were concluded with the execution of an amendment agreement dated June 24, 1975. This contract covers, among other things, the services which the Company performs in wheeling Hetch Hetchy energy to City's municipal consumers in and out of San Francisco. Through bargaining based on the cost-of-service principle and on the changes in conditions incident to wheeling of Hetch Hetchy power by Company over the last three decades, City negotiators were able to obtain for the City prospective annual net savings in the amount of \$290,000.

HETCH HETCHY ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, the HETCH HETCHY WATER AND POWER DEPARTMENT and the BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy* is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.

Through its Transit Power Division, Hetch Hetchy has funded, operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Railway since July 1, 1969.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.



NEW MOCCASIN POWERHOUSE AND PENSTOCK

* Hetch Hetchy is an Indian name for the valley in the Sierra where the Department's first dam was built.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design and construction of City-owned street lighting improvements are under the jurisdiction of the Department of Public Works, and plans for these improvements must be approved by the Public Utilities Commission through this Bureau. The Bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1974-75, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>Number of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	199	\$ 18,695,408
Hetch Hetchy Water and Power (Transit Power Division)	52	2,968,471
Bureau of Light, Heat and Power	<u>11</u>	<u>7,747,732</u>
	262	\$ 29,411,611

HETCH HETCHY WATER AND POWER SYSTEM

REVENUES AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and seven industrial customers:

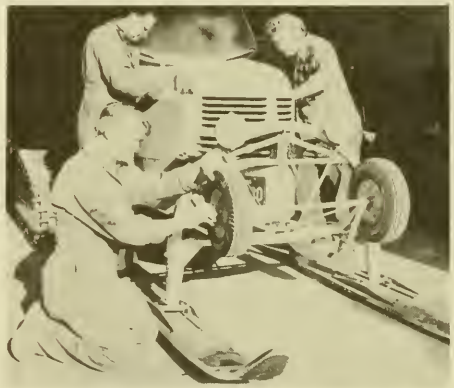
Kaiser Cement and Gypsum Corporation	Santa Clara County
Kaiser Aluminum & Chemical Corporation	Santa Clara County
Lockheed Missiles and Space Company, Inc.	Santa Clara County
General Motors Corporation	Alameda County
IBM Corporation	Santa Clara County
Liquid Air, Inc.	Alameda County
Norris Industries, Riverbank	Stanislaus County

2. Sale of water to the San Francisco Water Department.

This past year, revenue from sale of water and standby service to the San Francisco Water Department was \$6,500,000.

Gross sale of electric energy amounted to \$18,484,718 compared to \$14,104,677 during the year 1973-74. This increase in electric revenue in part reflected the increase in actual sales during the year; 2,025,074,464 kilowatthours as compared to 1,823,491,146 kilowatthours for 1973-74.

MOCCASIN AUTOMOTIVE SHOP
WITH SNO-CAT
(L TO R) DICK WHITE, Gen.
Util. Mech.; WARREN WOOLEY,
Gen Util. Mech; KEN BLAU,
Auto Serviceman



WATER REVENUE \$ 6,500,000

MISCELLANEOUS REVENUE
\$ 144,126

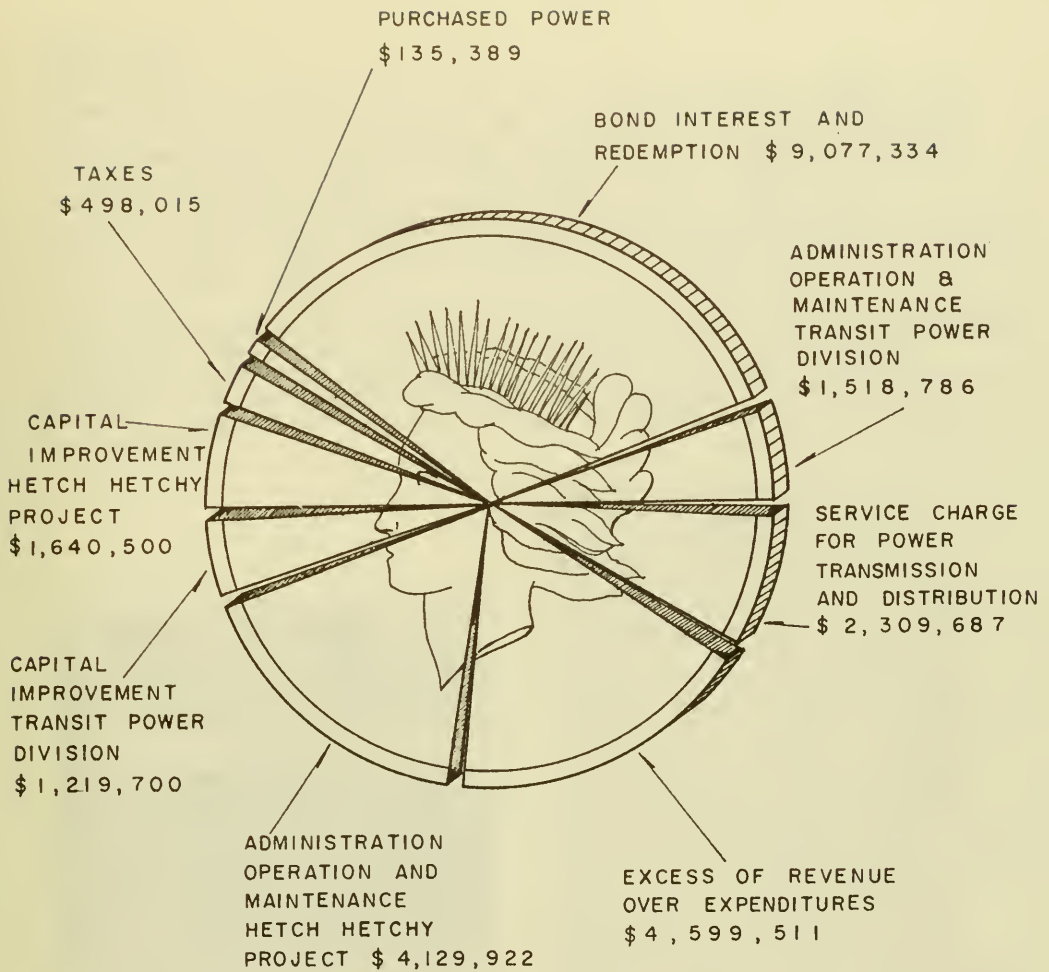


POWER REVENUE \$ 18,484,718

TOTAL \$ 25,128,844

HETCH HETCHY REVENUES

FISCAL YEAR 1974 - 75



TOTAL \$ 25,128,844

HETCH HETCHY EXPENDITURES

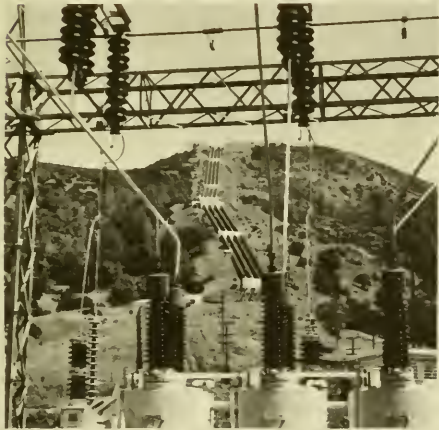
FISCAL YEAR 1974 -75



POWER SALES

Power and energy delivered to all City Departments decreased 0.3% over the previous year, totally the result of reduced consumption at the San Francisco International Airport. The Airport, usually the single biggest energy consumer of the City departments, contributed significantly to the overall result with a 4.4% reduction, while all other City Department showed increases varying from 0.7% for street lighting to as much as 8.9% for the San Francisco Water Department, principally for pumping load.

Hetch Hetchy power is sold to City Departments at cost, representing a saving to taxpayers for 1974-75 of approximately \$4 million compared to the cost if supplied by the local investor-owned utility at current rates which are more than 50% higher than those in effect some four years ago because of continued escalation in fuel prices.



MOCCASIN SWITCHYARD
AND PENSTOCK

Power and energy delivered to Modesto Irrigation District, Hetch Hetchy's largest power customer, and to Turlock Irrigation District, the third largest, decreased by 7.7% and 27.6% respectively this year. The reason for the Districts' decrease is due largely to the fact that more than normal generation was available from their own generating plants because of the increased water storage behind Don Pedro Dam resulting from three successive above-normal-precipitation years. The effect of Don Pedro storage on each of the two Districts is different. It has less effect on Modesto's purchase, since Modesto normally generates less than 20% of its total load requirements. Turlock's own generation in 1974-75 accounted for nearly 70% of its total requirements, which is about two-thirds of Modesto's.

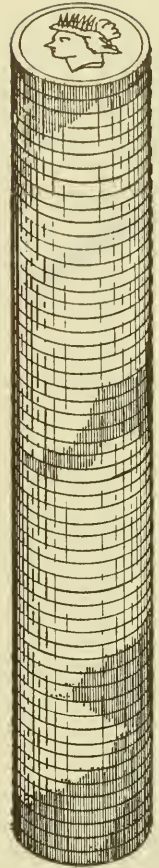
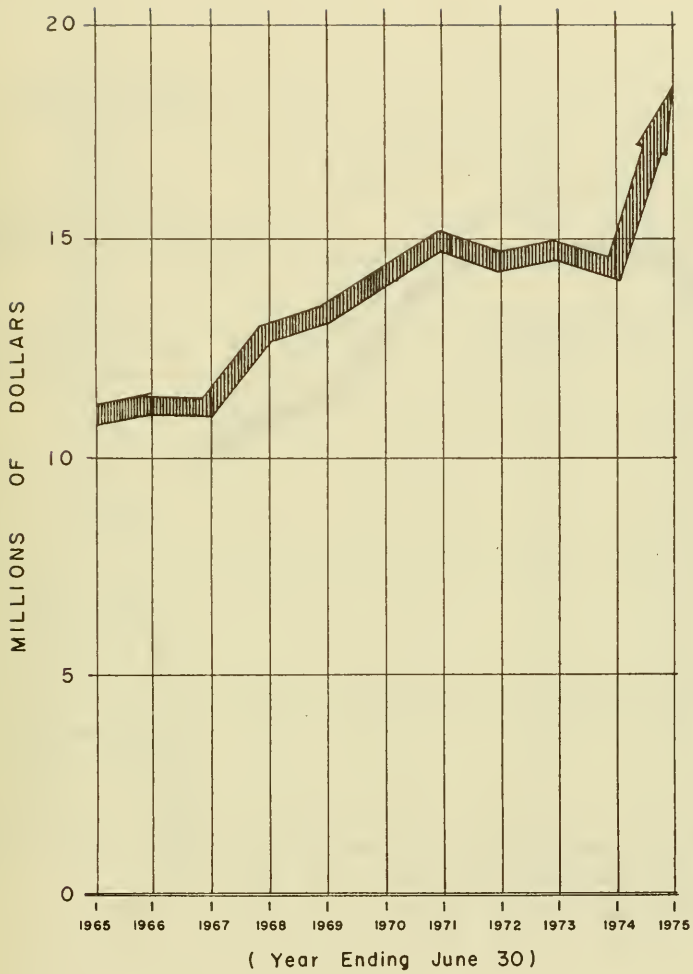
Gross sale of electric energy amounted to \$18,484,718 compared to \$14,104,677 during 1973-74. This record increase in revenue can be attributed to three reasons: (1) As a result of higher-than-normal precipitation on the Tuolumne River watershed the past two years, total electrical generation of the Hetch Hetchy powerhouses increased from 1,992,850,000 kilowatthours in fiscal year 1973-74 to 2,057,609,000 kilowatthours in fiscal year 1974-75, an increase of 3.25 percent. This establishes a new record for total project electrical generation for one fiscal year. (2) The withdrawal of 123,458,969 kilowatthours of electrical energy which was deposited the previous year under City's "banking" arrangement with the Pacific Gas and Electric Company and (3) The sale to industrial customers at the high PGandE rates of 567,294,414 kilowatthours of energy, an increase of 2 1/2 times as compared to 227,596,800 kilowatthours for 1973-74.

Another favorable effect of the record generation is the decrease in expenditure for supplementary power and energy from \$447,270 to \$99,734.

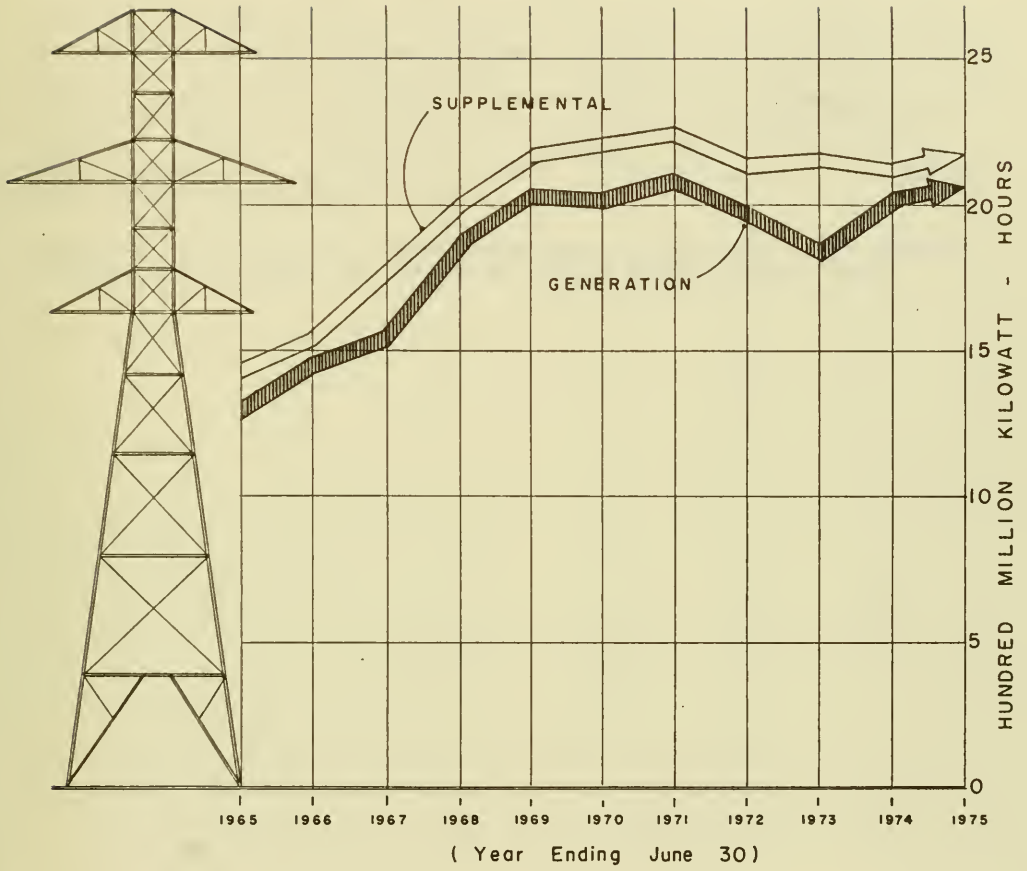
In order to guarantee a market for the large quantity of excess energy which was deposited with the Company in 1973-74 and which would be withdrawn this year, the Pacific Gas and Electric Company assigned to the City, as a temporary accommodation, four additional industrial customer loads during the year, namely: Liquid Air, Inc. in Union City under an agreement dated August 12, 1974, Lockheed No. 2 in Sunnyvale, General Motors Corporation in Fremont and IBM Corporation in San Jose, all under individual agreements dated September 10, 1974.

October 29, 1974 marked the beginning of negotiations with the Pacific Gas and Electric Company for extension of the March 14, 1975 "Main Contract" between the Company and the City and County of San Francisco. This contract, which expires July 31, 1975, covers such items as the wheeling of Hetch Hetchy power to the City's municipal customers, and the furnishing of supplementary energy and standby service to the City. These negotiations entail extensive review and analysis of the cost of service to various municipal loads. In order to assist and advise the Hetch Hetchy staff in these negotiations, the Public Utilities Commission authorized the employment of an expert consultant, Mr. Roy A. Wehe. After seven months of fruitful exchanges, negotiations were satisfactorily concluded with the execution of an amendment agreement on June 24, 1975. These negotiations have resulted in prospective annual net savings to the City for wheeling charges in the amount of at least \$290,000.

On May 27, 1975, the San Francisco Public Utilities Commission adopted a new set of rate schedules for the sale of Hetch Hetchy power to private consumers and the Municipal Departments of the City, replacing a similar set which had been in effect since July 1, 1958. At about the same time, a staff study to determine the cost to serve the City departments was also made. It was found that based on test year 1973-74, a zero discount applied to billings for energy supplied to the San Francisco International Airport for resale to its tenants and a 45.5% discount to billings for energy supplied to City Departments for Municipal purposes would permit the recovery of cost. It is estimated that beginning July 1, 1975, the change in rates together with the change in discounts for the City departments will increase Hetch Hetchy's annual power revenue by one million dollars.



REVENUE FROM SALE OF ELECTRIC ENERGY



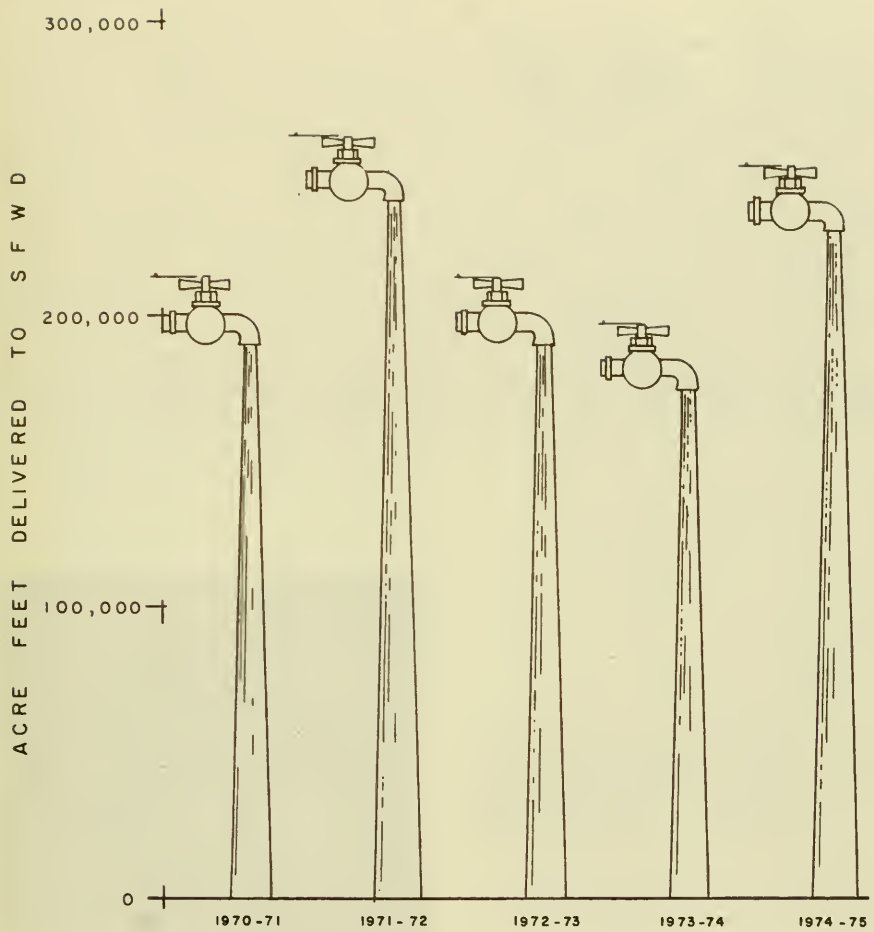
HETCH HETCHY POWER SYSTEM OUTPUT

WATER PRODUCTION AND TRANSMISSION

Precipitation recorded for the year at our measuring stations was 107% of the long term average.

During the year, 80,321,370,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 86% of the City's total customer consumption. In addition, 236,999,312 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 49,229,620 gallons were delivered to Groveland Community Service District in Tuolumne County from the Mountain Tunnel.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT

OPERATION AND MAINTENANCE - MOCCASIN DIVISION

Holm Powerhouse Unit No. 2 Generator

The No. 2 generator at Dion P. Holm Powerhouse was shut down by protective relays at 6:26 p.m. on Sunday, January 5, 1975, indicating a failure to ground in the stator winding. Immediate preliminary investigation established that the fault was confined to Phase C of the 3-phase winding. The following day it was determined that the fault was limited to a single coil in a slot location that was readily accessible. It was also determined that bypassing the defective coil and then restoring the circuit continuity would be a simple solution, one that would not affect the operation of the generator adversely. An Allis-Chalmers Corporation factory engineer was contacted and repair efforts were begun. The repairs were made by departmental forces under the supervision of the Allis-Chalmers representative and the unit was restored to service on the following Sunday, January 12, 1975. The total outage of the unit was therefore limited to only one week by the fortunate location of the fault and swift, concentrated efforts by departmental personnel.



MOCCASIN ELECTRIC SHOP
(L TO R) HAROLD SCOTT - Elect.;;
DON ANDERSON - Elect.;;
HERB SWANSON - Lineman

Kirkwood Powerhouse Unit No. 1 Power Transformer

The Kirkwood Powerhouse Phase B transformer for Unit No. 1 that failed on January 3, 1974, was repaired, tested and returned to service on September 4, 1974. The substitute transformer which was rented from PGandE for the duration of the repair work was shipped back to PGandE. The use of the substitute transformer, which enabled the powerhouse to operate at full capacity from February 4, saved the City more than \$150,000 per month during the period of repair, about six months.



MOCCASIN PAINT SHOP
JOE WADELL, Painter



MOCCASIN CORP. YARD
Pipe Threading
ERVIN JOHNSON (L), Plumber
BILL STEELY, Plumber

OPERATION AND MAINTENANCE - TRANSIT POWER DIVISION

The Transit Power Division is responsible for supplying the 600 volt direct current power that is necessary to operate the street-cars and trolley coaches of the San Francisco Municipal Railway. The Division is composed of two sections: Motive Power and Overhead Lines.

MOTIVE POWER SECTION

This Section operates and maintains seven substations which convert electric power from 12,000 volts alternating current to 600 volts direct current by means of motor-generators, synchronous converters, and mercury arc rectifiers. (See Appendix Table 3 for statistical data.) Motive Power is also responsible for maintaining the electric motors and associated control equipment for operating the cable-winding machinery located in the Cable Car Powerhouse at Washington and Mason Streets. In addition, Motive Power is also responsible for periodic inspection, cleaning, adjusting and repairing the streetcar and trolley coach recorders at Central Control of the Municipal Railway. The substations operate 24 hours per day, 7 days per week, 365 days per year.

On December 30, 1974 the 700 horsepower motor which drives the Cable Car System, failed due to an internal electrical fault. Our powerhouse electricians disassembled the motor and found the fault in the wound rotor. A local motor repair shop (Reyna Electric) was able to repair the damaged winding without the delay and expense of rewinding the rotor. Our powerhouse electricians reassembled the motor, tested it and returned it to service on January 15, 1975.

The following day (January 16, 1975) the other motor (750 hp) which drives the Cable Car System failed to start. Our powerhouse electricians disassembled it and found it had a fault similar to that found in the 700 hp motor. Again, Reyna Electric was able to repair the fault without rewinding the rotor. Our powerhouse electricians reassembled the motor, tested it and made it available for service on February 19, 1975.

While the rotors were being repaired, the stator coils and housing of both motors were cleaned, inspected, painted with insulating enamel and dried using heat lamps.

Because the Cable Car System frequently overloaded its driving motor and caused the protective overload sensor to disconnect the motor by tripping its circuit breaker, a recording ammeter was installed in the switchgear panel to monitor the load. The recorder subsequently showed that the cable system load was far exceeding the rating of the driving motors.

OVERHEAD LINES SECTION

The primary function of the Overhead Lines Section is to maintain the trolley wire overhead facilities and the electric distribution system (both overhead lines and underground cables) which conveys power to it. Secondary functions include the maintenance of the Municipal Railway Signal Systems and the electric light and power systems of all Municipal Railway buildings.

During the fiscal year 1974-75, the Overhead Lines Section responded to 4,184 emergency calls. In addition to emergency calls, this section has a regular and extensive maintenance program for overhauling all overhead and underground facilities. This section operates with three shifts per day, seven days a week. Monday through Friday, the normal workday shift is from 8:00 a.m. to 3:00 p.m. with a two-man emergency crew on the "swing" or evening shift (3:30 p.m. - 10:30 p.m.) and the graveyard shift (1:00 a.m. - 8:00 a.m.). On Saturdays, Sundays and holidays there is a two-man emergency crew on each of three eight-hour shifts; midnight to 8:00 a.m., 8:00 a.m. to 4:00 p.m., and 4:00 p.m. to midnight.

Overhead and underground facilities are systematically inspected, and worn or damaged parts are replaced before they can cause accidents or malfunction of equipment.

A considerable amount of damage to overhead facilities was caused by trolley coaches dewiring and snagging their poles in the overhead facilities and tearing them down, or by breaking the spans with the flying poles. Such damage is repaired at no cost to the Municipal Railway. Other parties who damage our facilities are billed for the cost of repairs. This includes damage to overhead facilities caused by high loads on trucks or careless operation of crane equipment and damage to underground feeder cables by contractors digging into our duct lines. During 1974-75, responsible parties were billed for 14 damage cases totalling \$16,702.95. The overhead Lines Section also performed work for building owners and contractors under work orders amounting to 19 jobs totalling \$24,545.24. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily

removing trolley wires and feeders to permit passage of high loads; and shifting of trolley wires and feeders for various excavations.

The Overhead Lines Section engaged in many other activities of a related nature which it is especially equipped to perform. These additional duties include repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car system; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.

ENGINEERING DIVISION

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project, the Transit Power Division and the Power Improvement Program. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Work of unusual magnitude which requires special knowledge and expertise is done by qualified engineering consulting firms and reviewed by the Engineering Division. The Division is organized into five main sections: Structural and Civil, Electrical, Mechanical, Architectural, and Construction.



PHOTO TAKEN DURING CONSTRUCTION OF HETCH
HETCHY AQUEDUCT, 9'6" PIPE, MARCH 1925

HETCH HETCHY PROJECT

During the year, plans and specifications were prepared for the following work to facilitate and maintain Hetch Hetchy Project operations (for construction work in progress during 1974-75 please refer to Table 18 in the Appendix):

HH-443 - Moccasin Dam Spillway, Construct Weir and Energy Dissipator and Red Mountain Bar Waste Way Training Walls

A contract was let to raise the weir at Moccasin Dam so that increased water flow can be delivered through the San Joaquin Pipelines and Coast Range Tunnel. In addition to the weir, an energy dissipator is to be constructed at the end of the spillway and training walls are to be erected at the Red Mountain Bar Waste Way. The energy dissipator is provided to protect the lower Moccasin Dam area from erosion during high volume spills. The training walls are required to contain and direct water spilled at Red Mountain Bar where high volume spills now overflow the existing structure and cause erosion.

HH-477 - Moccasin Penstock Valve House

Plans and specifications have been prepared for the construction of a steel frame structure to enclose the butterfly valves at the head of Moccasin Penstock. The structure will provide protection and security for the valves.

HH-454 - Reconstruct Moccasin Sewage Disposal System

A package sewage treatment plant producing an odorless effluent and sludge has been planned to replace the existing septic tank system. A reapplication is in process for a Federal "Clean Water Grant" that should cover a substantial portion of the cost of construction of the project. Negotiations to acquire land for an effluent sprinkler field, as required by the State Water Quality Control Board, have been



FINN HAASKJOLD
Mechanical Engineer

completed and the land will be purchased. Work is in progress to satisfy the requirements of the State Water Resources Control Board and the Regional Water Quality Control Board (Central Valley Region).

HH-499R - Moccasin and Early Intake - Reroof Cottages

Reroofing of six cottages at Moccasin.

HH-507 - Cherry Road, Resurface Mile Post 16.1 to Mile Post 23.4

A contract was let to resurface a portion of Cherry Road. An asphalt wearing surface is to be applied to a length that had been damaged by logging operations (Mile Post 16.1 to 17.1). The remainder of the road (Mile Post 17.1 to 23.4) will receive an asphalt seal coat and rock screenings to prolong the life of the road surface.

HH-515 - Moccasin Shop and Warehouses - Replace Windows

The contract was for the replacement of existing deteriorated wood windows with new aluminum fixed windows and shop building, line warehouse building and Warehouse No. 2 building at Moccasin.

HH-516 - Storage Shed - Repair Roof

Repairing the roof on the storage shed which is part of the storeroom building at Bryant.

HH-518 - Tesla Portal Overflow Shaft Extension

A contract was let to extend the Tesla Portal Overflow Shaft. The extended shaft along with other improvements will allow a greater volume of water to be pushed through the Coast Range Tunnel.

TRANSIT POWER DIVISION

During the year, plans and specifications were prepared for the following work to facilitate and maintain Transit Power Division operations (for construction work in progress during 1974-75 please refer to Table 18 in the Appendix):

HH-494 - Replace, Repair and Paint Steel Trolley Poles
(Fulton Street)

Contract plans and specifications have been completed to replace,

repair and paint steel trolley poles on Fulton Street, La Playa Street and Mission Street. The contract is scheduled to be let in August 1975. This work is part of a program to rehabilitate all steel trolley poles in the City.

HH-520 - Haight Street, Stanyan Street to Central Avenue -
Painting Steel Trolley Poles

A contract was let to paint steel trolley poles on a section of Haight Street. The poles were in a deteriorated state and were painted to arrest further corrosion and to improve their appearance.

HH-538 - Paint Trolley and Street Lighting Poles - Sutter Street, from Taylor Street to Presidio Avenue

In response to a request from a neighborhood association to paint poles along Sutter Street to improve the street's appearance, contract plans and specifications for painting have been completed. The contract is scheduled to be let in September 1975. Both City and PGandE facilities will be painted under this contract and an agreement has been negotiated with PGandE for payment of its share of the work.

POWER IMPROVEMENT PROGRAM

Work during fiscal year 1974-75 under the Federal Grant of \$19.8 million (total Project Cost of \$29.65 million) approved by UMTA for the Power Improvement Program was as follows (for construction work in progress during 1974-75 please refer to Table 18 in the Appendix):

1. Grant Amendment

An amendment increasing the total Project Cost to \$57.7 million and the Federal Grant to \$42.1 million was submitted to UMTA for approval on February 24, 1975. Since the preparation of the original budget, certain operating criteria and power requirements of the new subway-surface light rail vehicles have changed or have become better defined. The effect on the power supply and distribution system was evaluated by an updating of the conceptual design approved by UMTA. The final report was received after approval of the Project grant and budget. Subsequent detailed engineering design has developed more realistic cost estimates. Unprecedented inflationary trends in materials and construction costs have resulted in greatly increased costs.

2. Electrification Project

A) Design Services

Preliminary design reports, covering the modifications to the existing streetcar trolley overhead wiring to permit pantograph operation and the installation of feeder cables, gap breaker stations and trolley wire systems in the Market Street Subway and the Twin Peaks and Sunset Tunnels, were reviewed with the consultant, PBQ&D, Inc. and Gibbs & Hill, Inc., and were accepted, with revisions to be incorporated into the final design. The consultant began work on final design contract plans and specifications.

Contract plans and specifications for Contract HH-521, Market Street Subway Electrification, Embarcadero Station to Duboce Portal, were completed and transmitted to UMTA for approval. Bids were received on May 15, 1975. The contract was awarded on May 27, 1975 to Amelco Electric, San Francisco, California, who submitted the low bid of \$1,077,000. The contract was certified by the City Controller on June 30, 1975. Work is scheduled to commence early in July 1975.

A decision was made to combine the Twin Peaks Tunnel Electrification with the TIP project for repairs to the tunnel. Plans and specifications for the electrification work were completed and sent to TIP for inclusion in Contract MR-622, Twin Peaks Tunnel Electrification, Structural Repairs and Improvements. TIP transmitted to UMTA for approval on June 3, 1975. Bids are scheduled to be received by TIP on July 9, 1975.

Amendment No. 1 to the professional services agreement was negotiated with the consultant. The amendment, which provides for additional professional services not covered under the agreement, was approved by the Public Utilities Commission on June 24, 1975, and was transmitted to UMTA for approval on June 27, 1975.

B) Cable Purchase

Technical specifications and bid documents for the purchase of insulated copper feeder cable were completed and submitted to UMTA for approval. Bids were received by the City Purchaser on March 24, 1975. The contract was awarded by the City Purchaser to Cyprus Wire and Cable Co., South San Francisco, California, who submitted the low bid of \$3,151,452. The contract was certified by the City Controller on May 1, 1975.

3. Substation Project

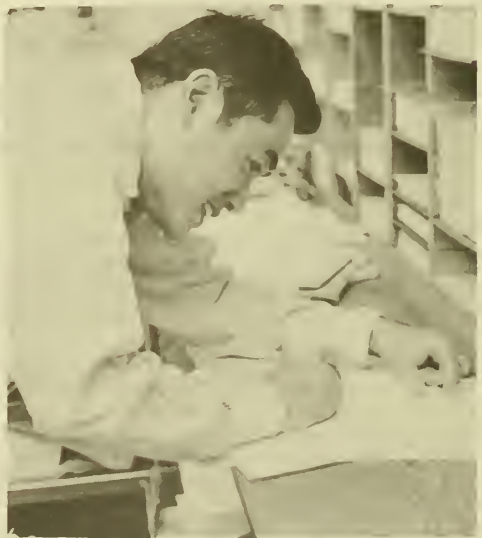
A) Design Services

Our consultant, Bechtel, Inc., continued design work on the substation buildings and equipment installation.

Plans and specifications for Contract HH-522, Civic Center, Church and Downtown Substation, Installation of Electrical Equipment, were completed and submitted to the Public Utilities Commission for approval. Plans and specifications are scheduled to be transmitted to UMTA for approval early in July 1975.

Plans and specifications at the 85% completion level for Carl Substation were submitted by the consultant and were reviewed by Hetch Hetchy and returned with comments. Plans and specifications at the 85% completion level for Judah and Laguna Honda are scheduled to be submitted by the consultant in July 1975.

Amendment No. 1 to the existing professional services agreement was negotiated with the consultant. The amendment, which includes consultant's review of substation equipment submittals, changes in the design of Laguna Honda Substation, and addition of sanitary facilities in certain substation, was submitted to UMTA for approval on December 5, 1974. The amendment which was approved by UMTA on January 22, 1975.



HAMILTON MARS
Assoc. Civil Engineer

Amendment No. 2 to the existing professional services agreement was negotiated with the consultant. The amendment, which provides for additional professional services not covered under the agreement or Amendment No. 1 to the Agreement, was approved by the Public Utilities Commission on May 27, 1975, and was forwarded to UMTA for approval on May 30, 1975.

Review of final plans and specifications for BARTD Contract 1S0041, West Portal Station, for compliance with our requirements for the West Portal Substation and electrification conduits and feeder details included in the contract, was completed and comments were transmitted to Transit Task Force.

Review of contract drawings and specifications for Contract MR-609, Muni Metro Center, for compliance with our requirements for the San Jose Substation and for feeder conduits and yard overhead construction included in the contract, was made and comments were transmitted to TIP.

Building designs for the six new substations, except for Taraval, received Phase II approval by the San Francisco Art Commission. Final (Phase III) approval for three of these substations, Laguna Honda, Judah and Carl, also received from the San Francisco Art Commission.

B) Substation Sites

All substation sites have received approval of the City Planning Commission for conformance to the City Master Plan, with the exception of Taraval as noted hereinafter due to necessity of alternate sites.

Independent appraisals by two outside real estate appraisal firms were completed for all new substation sites.

Jurisdiction of the Laguna Honda Substation site was transferred from the City Health Department to Hetch Hetchy by the Board of Supervisors on December 12, 1974.

Following concurrence by UMTA on the purchase price for Judah Substation site, the Public Utilities Commission adopted a resolution which approved the acquisition and recommended to the Board of Supervisors that they approve the acquisition. The Board of Supervisors approved the acquisition. The site was vacated as of June 13, 1975; keys to the existing building were delivered to Hetch Hetchy by the Real Estate Department.

Negotiations for the Taraval Substation site, a privately owned vacant lot, brought out the possibility of Eminent Domain action to acquire the property. UMTA has concurred with the price offered and the use of Eminent Domain action. Authority to proceed with Eminent Domain procedure for acquisition of this approved Taraval Substation site near 32nd and Taraval was withheld by the San Francisco Board of Supervisors' Finance Committee at their meetings on January 15 and January 29, 1975. At their direction, alternative sites have been found on Taraval Street near 40th Avenue and 42nd Avenue.

Environmental Impact Data on the alternative sites, to supplement that on file, was forwarded to UMTA, as requested, prior to approval by UMTA of proceeding with real estate appraisals as the first step in acquisition of one of the sites.

A supplementary Environmental Impact Statement on the alternative Taraval sites was filed with and evaluated by the San Francisco City Planning Department, in accordance with the California Environmental Quality Act of 1970, with the finding that the project could have no significant effect on the environment. A negative declaration was prepared, posted, and advertised, and it received no notice of appeals within the required time limits. An EIR will not be required.

City Planning Department was requested to review the two alternative Taraval Substation sites for conformance with the City Master Plan.

Acquisition of either of the two alternative Taraval Substation sites was approved by UMTA on March 16, 1975. Community approval of both sites was received from the Taraval - Parkside Merchants Association and the Parkside District Improvement Club. The two sites are being reviewed by City Planning for Master Plan Conformance. Real Estate Department is proceeding with the ordering of independent appraisals of the sites.

Negotiations with Pacific Gas and Electric Company for an easement for the Randolph Substation site, and for the relocation of PGandE energized underground electric distribution facilities within the easement, was completed. A rear yard variance to provide space for the Randolph Substation Building was granted by San Francisco Planning Department. A work order to PGandE for relocating their electric distribution facilities from the proposed

Randolph Substation site was transmitted to UMTA for approval on April 9, 1975. The work order was approved by UMTA on June 2, 1975, and was certified by the City Controller on June 17, 1975. The work order will become effective after PGandE grants the easement for the substation to the City. Legislation necessary for the acquisition of the easement is underway.

Meetings were held with San Francisco Redevelopment Agency, City Real Estate Department and Hetch Hetchy to develop the terms for use of the Fillmore Substation site to be obtained from the Redevelopment Agency.

C) Equipment Purchase

Work commenced on fabrication of substation equipment. Meetings were held with ITE Imperial Corporation to review technical specifications and to coordinate delivery of equipment with future contracts for construction of substation buildings and installation of equipment. Shop drawings, wiring diagrams and other equipment data are continuing to be submitted for approval and are reviewed by Hetch Hetchy and our consultant, Bechtel. Equipment modifications, required by detailed design criteria and increased Project requirements, are being processed.

4. Control and Communication Project

The negotiated agreement between Systems Control, Inc. and the City was approved by UMTA on September 6, 1974. The agreement was certified by the City Controller on December 30, 1974 and work began on January 15, 1975. Following a meeting held on January 22, 1975 with Hetch Hetchy to establish project schedule, identify key design criteria and to cover interfaces of this project with other portions of the Power Improvement Program, the consultant began gathering data to establish design criteria for the preliminary report required under the contract. The preliminary report was submitted by the consultant in June 1975 and was being reviewed by Hetch Hetchy staff.

5. Feeder Undergrounding

A) United Nations Plaza (D.P.W. Contract 23,476)

Bids for the United Nations Plaza, which include construction of underground duct lines for PIP were received on January 8, 1975. The contract, including PIP work in the amount of \$31.130 was awarded to the low bidder, Homer J. Olsen, Inc., on January 29, 1975. Construction began in March 1975.

B) Judah Street (D.P.W. Contract 23,506)

Construction work commenced on the relocation of trolley poles and the undergrounding of feeder cables included in the Department of Public Works contract for Judah Street, 4th to 20th Avenues - Street Improvements and Track Reconstruction.

C) 2nd and Mission Streets (Contract HH-489)

All work on this contract was completed in accordance with contract plans and specifications on August 26, 1974.

D) Market Street - 7th to 8th Streets
(Contract HH-492)

All work on this contract was completed in accordance with contract plans and specifications on September 9, 1974.

E) 19th Avenue and Municipal Railway Right-of-Way - St. Francis Circle to Junipero Serra Boulevard
(Contract HH-493)

All work on this contract was completed in accordance with contract plans and specifications on July 17, 1974.



JOHN KELLOGG
Civil Engineer

F) Ecker and Stevenson Streets - Underground Duct System
(Contract HH-496)

Plans and specifications for constructing underground manholes and duct banks in Ecker and Stevenson Streets were approved by UMTA. Bids were received on August 19, 1974. The contract was awarded to Underground Construction Company, Inc., San Leandro, California, who submitted the low bid of \$98,810. Construction commenced on October 7, 1974. All work on the contract was completed in accordance with contract plans and specifications on February 11, 1975.

G) Market and Ecker Street - Construct Manhole (Work Order)

Construction work commenced in July 1974 on this contract. All work covered by the Work Order was satisfactorily completed on October 21, 1974 by Cahill Construction Company.

II) Fillmore Street - Hayes to Pine Street (Contract HH-491)

Plans and specifications for the installation of underground power facilities on Fillmore Street between Hayes and Pine Streets were approved by UMTA on September 4, 1974. Bids were received on October 10, 1974. The contract was awarded to Abbett Electric Corporation, San Francisco, California, who submitted the low bid of \$737,618. Construction commenced in December 1974.

I) Junipero Serra Boulevard Track Reconstruction and Landscaping (Contract MR-595R)

Following approval by UMTA, bids for Contract 595, a joint TIP/PIP project, which includes the construction of underground duct lines and installation of feeder cables for the Power Improvement Program, were received on July 29, 1974. After careful evaluation of the sole bid received, which was considerably above the Engineering estimate, and extensive discussion with the UMTA representative, it was agreed that TIP Control Group re-design and readvertise the project. Bids were received on September 20, 1974. The contract was awarded to Homer J. Olsen, Inc. who submitted the low bid which included \$62,400 for the PIP portion of the contract. Work on the duct lines and manholes (feeder cables eliminated in revised contract) commenced in November 1974 and was completed in June 1975.

- J) Ocean and Phelan Avenues Rechannelization
(D.P.W. Contract 23,727)

Plans, specifications and cost estimate for the relocation of trolley poles and the overhead trolley wire system and the undergrounding of feeder cables which will be included, along with Muni Railway streetcar track relocation and rerailing in a Department of Public Works contract for Ocean and Phelan Avenues Rechannelization, were transmitted to the Department of Public Works in November 1974. Plans and specifications for the combined contract were completed by the Department of Public Works and are scheduled to be transmitted to UMTA and the Federal Assisted Urbanization (FAU) for approval in August 1975.

- K) Ocean Avenue - Junipero Serra Boulevard to Harold Avenue -
Underground Duct System (Contract HH-502)

Plans and specifications for constructing manholes and underground duct banks in Ocean Avenue between Junipero Serra Boulevard and Harold Avenue were completed and were received on January 2, 1975. The contract was awarded to Amelco Electric, San Francisco, California, who submitted the low bid in the amount of \$196,148. Construction work commenced in March 1975.

- L) West Portal Avenue and Taraval Street - St. Francis Circle to
20th Avenue - Underground Duct System (Contract HH-498)

Plans and specifications for constructing manholes and underground duct banks in West Portal Avenue, Ulloa Street, 14th Avenue and Taraval Street between St. Francis Circle and 20th Avenue were completed and were transmitted to UMTA for approval. Bids were received on January 30, 1975. The contract was awarded to Underground Construction Company, Inc., San Leandro, California, who submitted the low bid in the amount of \$229,585. Construction commenced in March 1975. All work on the contract was completed in accordance with the contract plans and specifications on June 20, 1975.

- M) 19th Avenue, Randolph and Broad Streets - Underground
Duct System (Contract HH-519)

Plans and specifications for constructing manholes and underground duct banks in 19th Avenue, Randolph Street, Orizaba Avenue and Broad Street between Junipero Serra Boulevard and Plymouth Street were completed and were

transmitted to UMTA for approval. Bids were received on March 17, 1975. The contract was awarded to Venturini Corporation, San Mateo, California, who submitted the low bid in the amount of \$179,780. Construction work commenced in May 1975.

- N) Church Street - 22nd Street to 30th Street - Underground Duct System (Contract HH-497)
- O) Taraval Street and 46th Avenue - 20th Avenue to Vicente Street - Underground Duct System (Contract HH-503)
- P) Sutter Street - Presidio to Leavenworth - Underground Duct System (Contract HH-525)
- Q) McAllister Street - Divisadero to Leavenworth - Underground Duct System (Contract HH-526)
- R) Haight, Fillmore, Church and Other Streets - Underground Duct System (Contract HH-527)
- S) Ocean Avenue, Persia Avenue and Mission Street - Metro Center to Russia Street - Underground Duct System (Contract HH-537)



DON BURDICK
Assoc. Electrical Engineer

Work commenced on the preparation of plans and specifications for constructing manholes and underground duct banks (Contracts HH-497, HH-503, HH-525, HH-526, HH-527, and HH-537). Feeder cables will be installed in these duct banks under a later contract.

- T) Judah Street - 20th to 48th Avenues - Underground Duct System (Contract HH-523)

Work was temporarily suspended on the preparation of plans and specifications for constructing manholes and underground duct banks in Judah Street between 20th and 48th Avenues. Feeder cables will be installed in these duct banks under a later contract. The delay is due to DPW determination of the extent of the Street Improvement and Track Reconstruction work.

- U) Other Work

Preliminary engineering and plans and specifications are proceeding for duct lines and feeder undergrounding in accordance with the requirements of the Program.

- V) Manhole Frames and Covers (First Contract)

Delivery of all manhole frames and covers, totalling 100 sets, was completed on September 25, 1974.

- W) Manhole Frames and Covers (Second Contract)

Contract documents for purchasing an additional 100 sets of manhole frames and covers for use on future Power Improvement Program contracts were prepared and transmitted to UMTA for approval. Bids were received by the City Purchaser on January 17, 1975. The contract was awarded to Phoenix Iron Works, Oakland, California, who submitted the low bid of \$32,100. The contract was certified by the City Controller and the Contractor began fabrication of the manhole frames and covers.

6. Overhead Line Work

- A) Junipero Serra Boulevard - St. Francis Circle to Ocean Avenue (Contract HH-517)

Work continued on preparation of plans and specifications for trolley pole replacement and overhead trolley wire installation on Junipero Serra Boulevard from St. Francis Circle to Ocean Avenue.

Under this contract, which will follow the track reconstruction and landscaping contract, MR-595R, under-

ground feeder cables will be installed in the ducts constructed under MR-595R and the existing overhead feeders will be removed.

The scope of this contract has been expanded to include underground cable installation on Ocean Avenue and West Portal Avenue in underground duct banks installed under Contract HH-498 and HH-502.

B) Trolley Coach Overhead Facilities for "Transit First" Program

Work commenced on the preparation of plans and specifications for the relocation of overhead facilities on Mission Street, Beale to South Van Ness, and 4th Street Market to Townsend, in implementation of the "Transit First" program of the City and County of San Francisco. Plans and specifications for the relocation of overhead facilities are scheduled to be transmitted to the Department of Public Works in July for inclusion into a Department of Public Works contract.



KARL ALMGREN
Civil Engineering Assoc. I

7. Miscellaneous

- A) Coordination meetings of the joint staffs of Transit Improvement Program and the Power Improvement Program were held.
- B) Coordination meetings were held between Hetch Hetchy staff and the consultants on the electrification, substation and control and communication projects.

BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 42.5% owned by the City; 55.6% owned by the Pacific Gas and Electric Company; and a small percentage, 1.9%, jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 81.1% of the lights are City-owned. Five years ago, the corresponding figure was 70.6%.

In fiscal 1933-34, the cost for street lighting was \$1.25 per capita; last year, with approximately thirty times as much light on the streets and public thoroughfares, the cost per capita was approximately \$1.83.



LINCOLN WAY LOOKING WEST
FROM 2ND AVENUE

AD VALOREM TAX \$ 1,240,817

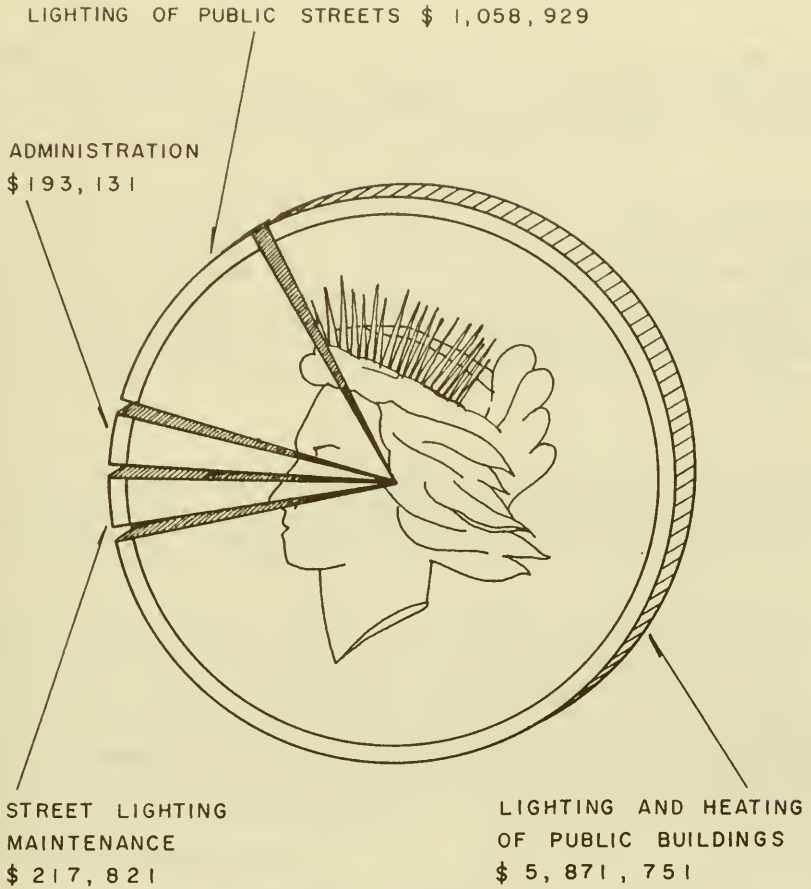


TRANSFERS FROM OTHER
DEPARTMENTS \$ 6,100,815

TOTAL \$ 7,341,632

BUREAU OF LIGHT, HEAT
AND POWER REVENUES

FISCAL YEAR 1974-75



BUREAU OF LIGHT, HEAT
AND POWER EXPENDITURES

FISCAL YEAR 1974-75

Maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Bureau. A second contract covered work required for repair of damaged and defective equipment, painting and miscellaneous maintenance.

Under contract, the Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours. Electric energy for all City and Company-owned street light operation was supplied by the Hetch Hetchy power system.

Engineering

The Bureau review, recommends changes, approvals or rejections of, and correlates all street lighting installations, including that done by the Department of Public Works, the Pacific Gas and Electric Company, the Bay Area Rapid Transit District, the State of California, subdividers, etc.

During the fiscal year 1974-75, 13 street lighting contract, involving a total of 641 new street lights, were approved by the Public Utilities Commission. Plans were submitted for approval only after careful checking to determine that illumination will exceed the minimum requirements established by the American National Standards Institute; and that all materials used, and manner of installation, meet with the applicable local, State and Federal rules, regulations and statutes governing the installation of electrical works.

Operation and Maintenance

As of June 30, 1975, a total of 37,061 City-owned and Company-owned street lights were in service in public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and type of units in service at the end of the fiscal year is shown in Appendix Table.

A total of \$1,281,316 was expended for operation, maintenance, and repair of the street lighting system. Of the total cost, \$12,614 was paid by the State for its share of the operation and maintenance of street lighting at intersections on City streets, which are part of the State Highway system. During the fiscal

year, there were 119 accidents involving damage to City-owned street lighting property. Investigation was made, as soon as possible, to remove hazards to the public and obstructions to traffic. Total cost of repairs to damaged City-owned street lighting property was \$60,732. Every effort was made to secure reimbursement for damages incurred from responsible parties. Previous experience indicates that approximately three-fourths of the repair costs will be recovered.

Complaints

During the year, 50 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and requests for temporary and permanent relocation of street lighting poles.

Improvements

During the fiscal year 1974-75, a total of 304 new City-owned street lights were placed in service at a cost of \$420,433. Improvements were financed by State Gasoline Tax and the 1972 Street Lighting Bond Issue as indicated in Appendix Tables 16 and 17.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas and steam supplied to municipal departments are furnished by the Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity, Gas and Steam

During the fiscal year, 478,595,675 kilowatthours of electrical energy were consumed through 1,003 municipal accounts at an expenditure of \$4,905,273. Of the above, 147,431,772 kilowatt-hours of energy were supplied to the San Francisco International Airport for resale to tenants. Natural gas consumption was 17,984,305 therms through 556 accounts at a cost of \$1,855,530. One account consumed 610,200 pounds of steam at a cost of \$1,475.

There were six increases in gas rates last year which increased the cost to municipal accounts by approximately \$474,246.

A summary of consumption and expenditures for these commodities is shown in Tables 12 and 13.

A P P E N D I X



MOCCASIN DAM

TABLE 1

HETCH HETCHY WATER AND POWERCOMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)FISCAL YEAR 1974-75

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 723,076	\$ 669,264	\$ -53,812
111	Overtime	16,500	15,688	-812
112	Holiday Pay	4,000	3,704	-296
113	Extended Work Week	2,400	1,434	-966
120	Temporary Salaries	53,100	49,665	-3,435
130	Wages	1,375,862	1,327,204	-48,658
139	Wages - Gardeners	44,180	42,201	-1,979
200	Contractual Service	120,685	116,352	-4,333
216	Maint. and Repair of Auto Equipment	9,000	8,559	-441
231-1	Purchase of Power for Resale	600,000	135,389	-464,611
232-2	Service Charge for Transm. and Dist.	2,557,000	2,309,687	-247,313
251	Subsistence of Employees	10,000	1,984	-8,016
300	Materials and Supplies	155,400	212,483	57,083
640	Water Rights and Damage Claims	12,000	495	-11,505
641	Hydrography	37,000	41,600	4,600
801	Accident Compensation	22,275	17,615	-4,660
804	Claims	500	-0-	-500
812	Fidelity Insurance	72	72	-0-
813	Automobile Insurance	8,043	10,599	2,556
814	Fire Insurance	6,989	8,297	1,308
815	Miscellaneous Insurance	12,178	12,178	-0-
853	Assessments Paid to Other Districts	56,000	12,664	-43,336
854	Membership Dues	5,312	5,334	22
855	Fees to U.S. Gov't.-Raker Act	30,000	30,000	-0-
856	Maint. Roads and Trials-Raker Act	15,000	12,745	-2,255
860	Retirement Allowance	473,782	396,367	-77,415
862	Social Security	101,375	101,127	-248
865	Health Service System	42,497	30,878	-11,619
870	Taxes	498,017	498,015	-2
880	Rental-Transmission Lines and Offices	114,000	114,000	-0-
900	Services of Other Departments	<u>838,621</u>	<u>838,621</u>	<u>-0-</u>
	TOTAL OPERATION AND MAINTENANCE	\$7,944,864	\$7,024,221	\$-920,643
400	Equipment	48,975	48,792	-183
500	Additions and Betterments	453,500	453,500	-0-
700	Reconstruction and Replacement	1,187,000	1,187,000	-0-
800	Bond Interest and Redemption	<u>9,061,069</u>	<u>9,077,334</u>	<u>16,265</u>
	TOTALS	<u>\$18,695,408</u>	<u>\$17,790,847</u>	<u>\$-904,561</u>

TABLE 2

SUMMARY OF TAXES

Fiscal Year 1974-75

HETCH HETCHY PROJECT

<u>Tax Levying Bodies</u>	<u>Assessed Values</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 2,050.00	\$ 224.54
San Joaquin County	39,050.00	4,255.58
San Mateo County	3,345.00	338.84
Stanislaus County	107,330.00	10,324.60
Tuolumne County	5,269,488.00	482,112.72
Banta-Carbona Irrigation Dist.	3,233.80	139.05
Oakdale Irrigation Dist.	25,897.00	517.94
West Stanislaus Irrigation Dist.	1,700.00	102.00
	<u>\$5,452,093.80</u>	<u>\$498,015.27</u>

TABLE 3

TRANSIT POWER DIVISION

MOTIVE POWER SECTION - SUBSTATIONS

Substation	Type (a)	Date Installed	No. of Units	KW Size	Fiscal Year 1974-75	
					Max. Loan in KW	KWH Converted to 600 v d-c
Bryant	M-G	1910	3	1500		
	M-G	1910	(b) 2	1500		
Turk	M-G	1910	3	1500		
	M-G	1910	(b) 2	1500		
Downtown	SC	1921	2	2000		
	SC	1924	1	3000		
Eighth Avenue	SC	(c) 1921	1	1500		
	SC	(c) 1921	(b) 1	1500		
	SC	1924	1	2000		
	MAR	1951	1	2000		
Outer Mission	MAR	1953	1	750		
Geneva	M-G	1910	3	1500		

Notes: (a) Type of Conversion Equipment:

M-G = Motor-Generator

SC = Synchronous Converter

MAR = Mercury Arc Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

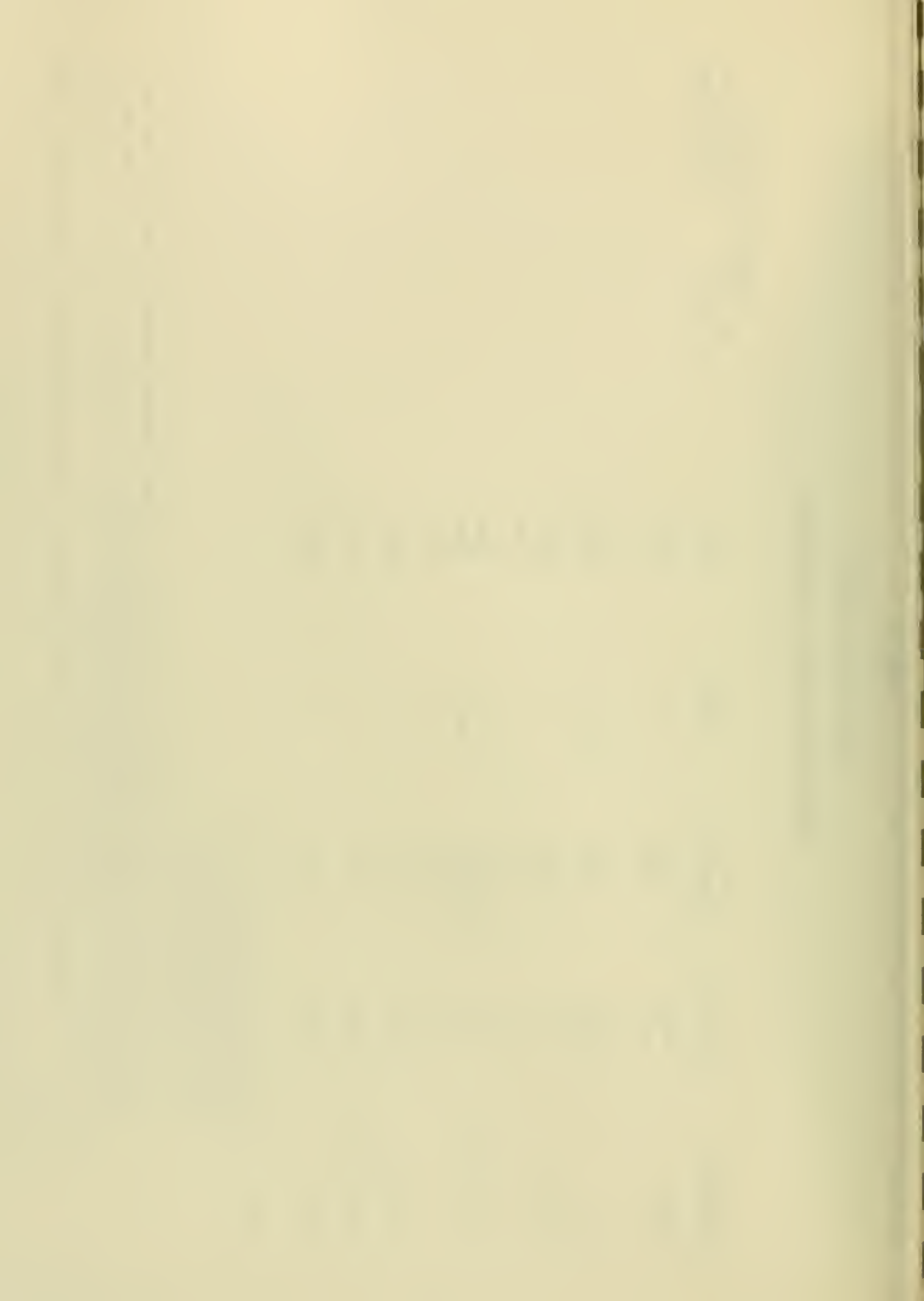


TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES

FISCAL YEAR 1974-75

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>UNDER, OVER</u>
110-1	Permanent Salaries	\$ 69,985	\$ 38,285	\$ - 31,700
130-1	Wages	1,098,907	984,110	-114,797
300-1	Materials and Supplies	49,600	20,289	- 29,311
801-1	Accident Compensation	31,725	25,089	- 6,636
860-1	Retirement Allowances	251,619	210,534	41,085
862-1	Social Security	53,822	53,692	- 130
865-1	Health Service System	22,563	16,394	- 6,169
900-1	Services of other Departments	169,525	169,525	0
	TOTAL OPERATION AND MAINT.	\$ 1,747,746	\$ 1,517,918	\$ -229,828
400	Equipment	1,025	868	- 157
500-1	Additions and Betterments	0	0	0
700-1	Reconstruction and Replacements	1,219,700	1,219,700	0
	TOTAL	\$ 2,968,471	\$ 2,738,486	\$ -229,985

TABLE 5

HETCH HETCHY WATER AND POWER

SUMMARY OF RECEIPTS AND EXPENDITURES

FISCAL YEAR 1974-75

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
Revenue from Sale of Electrical Energy	\$ 15,632,400	\$ 18,484,718	\$ 2,852,318
Revenue from Sale of Water and Standby Charge, SFWD	6,500,000	6,500,000	0
Other Revenue	100,000	144,126	44,126
	<u>\$ 22,232,400</u>	<u>\$ 25,128,844</u>	<u>\$ 2,896,444</u>
 <u>EXPENDITURES</u>			
Total Expenditures	<u>\$ 21,663,879</u>	<u>\$ 20,529,333</u>	<u>\$ -1,134,546</u>

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

SEASON PRECIPITATION (INCHES)	Normal	1970-71	1971-72	1972-73	1973-74	1974-75
Hetch Hetchy	34.27	29.95	24.84	35.97	38.46	39.15
Lake Lloyd	46.92	41.94	32.77	46.03	57.45	47.86
Approx. Percent of Normal	100%	89%	71%	102%	112%	107%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	732,234	681,600	584,400	780,799	871,240	769,239
Lake Lloyd)	428,210	409,100	331,800	444,358	533,923	450,131
Lake Eleanor)						
Total	1,160,444	1,090,700	916,200	1,225,157	1,405,163	1,219,370
Approx. Percent of Normal		95%	79%	106%	121%	105%
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>						
	No Spill					
	Capacity					
Hetch Hetchy	360,360	356,617	324,530	362,736	360,163	327,963
Lake Lloyd	268,800	199,983	151,653	217,872	268,284	239,909
Lake Eleanor	27,100	27,403	2,110	27,016	26,726	26,823
Total	656,260	584,003	478,293	607,624	655,173	594,695
<u>DELIVERY TO SFWD (ACRE-FT.) (a) (b)</u>						
Average per day		578	702	585	532	675
Maximum per day		748	856	856	850	925
Total for fiscal year		210,992	257,046	213,684	193,518	246,514

Total since operation of Hetch Hetchy Aqueduct began in 1934.

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.

(b) Includes delivery to Livermore site, U.S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1974-75

<u>PLANT DATA</u>	<u>Nameplate Rating</u> <u>(Kilowatts)</u>	<u>Capability</u> <u>(Kilowatts)</u>	<u>Annual Plant</u> <u>Factor - %</u>
Moccasin Powerhouse	90,000	104,000	59.3
Dion R. Holm Powerhouse	135,000	150,000	66.7
Robert C. Kirkwood Powerhouse	67,500	85,000	86.1
Total	<u>292,500</u>	<u>339,000</u>	
 <u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse		539,990,000	
Dion R. Holm Powerhouse		876,536,000	
Robert C. Kirkwood Powerhouse		<u>641,083,000</u>	2,057,609,000
 <u>Station Service</u>			
Moccasin Powerhouse		868,000	
Dion R. Holm Powerhouse		1,488,440	
Robert C. Kirkwood Powerhouse		<u>985,370</u>	<u>3,341,810</u>
 <u>Net Generation</u>			
			2,054,267,190
 <u>Supplementary Energy</u>			
"Bank" Withdrawal*		123,458,969	
Purchase (PGandE)		<u>0</u>	<u>123,458,969</u>
 <u>Total</u>			
			<u>2,177,726,159</u>
 <u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts		481,275,895	
Modesto Irrigation District		734,880,000	
Turlock Irrigation District		219,120,000	
Kaiser Cement and Gypsum Corporation		143,688,000	
Kaiser Aluminum and Chemical Corporation		28,137,600	
Norris Industries, Inc.		21,695,155	
Lockheed Missiles and Space Company, Inc.		209,304,000	
General Motors Corporation		75,978,000	
I B M Corporation		82,047,387	
Liquia Air, Inc.		28,139,425	
Miscellaneous Customers		<u>809,002</u>	2,025,074,464
 <u>Non-Revenue</u>			
Project Use		3,264,541	
"Bank" Deposit*		<u>33,771,707</u>	37,036,248
 <u>Losses</u>			
Hetch Hetchy System		41,538,492	
PGandE System (Municipal Accounts)		<u>74,076,955</u>	<u>115,615,447</u>
 <u>Total</u>			
			<u>2,177,726,159</u>

* In accordance with letter-agreement between City and PGandE dated 6/24/7

TABLE 8

HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1973-74 AND 1974-75
(Nearest 100,000 Kilowatthours)

<u>CUSTOMER</u>	<u>1973-74</u>	<u>1974-75</u>
Municipal Accounts		
International Airport	198,700,000	189,900,000
Municipal Railway	63,600,000	64,800,000
Public Works	26,000,000	26,600,000
Street Lighting	45,500,000	45,800,000
Unified School District	37,800,000	38,300,000
Water Department	40,400,000	44,000,000
Other City Departments	70,500,000	71,900,000
Modesto Irrigation District	787,400,000	734,900,000
Turlock Irrigation District	302,800,000	219,100,000
Kaiser Cement and Gypsum Corp.	156,700,000	143,700,000
Kaiser Aluminum and Chemical Corp.	31,300,000	28,100,000
Norris Industries, Inc.	22,500,000	21,700,000
Lockheed Missiles & Space Co., Inc.	39,600,000	209,300,000
General Motors Corporation	0	76,000,000
I B M Corporation	0	82,100,000
Liquid Air, Inc.	0	28,100,000
Miscellaneous Customers	700,000	800,000
	<u>1,823,500,000</u>	<u>2,025,100,000</u>

TABLE 9

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1973-74 AND 1974-75
 (Nearest \$1,000)

<u>CUSTOMER</u>	<u>1973-74</u>	<u>1974-75</u>
Municipal Accounts		
International Airport	\$ 1,666,000	\$ 1,588,000
Municipal Railway	640,000	649,000
Public Works	321,000	333,000
Street Lighting	481,000	485,000
Unified School District	560,000	567,000
Water Department	376,000	395,000
Other City Departments	902,000	912,000
Modesto Irrigation District	4,510,000	4,289,000
Turlock Irrigation District	1,696,000	1,483,000
Kaiser Cement and Gypsum Corp.	1,773,000	1,927,000
Kaiser Aluminum and Chemical Corp.	377,000	418,000
Norris Industries, Inc.	225,000	227,000
Lockheed Missiles & Space Co., Inc.	483,000	2,772,000
General Motors Corporation	0	1,054,000
I B M Corporation	0	1,122,000
Liquid Air, Inc.	0	373,000
Miscellaneous Customers	<u>9,000</u>	<u>9,000</u>
TOTAL	\$ <u>14,019,000</u>	\$ <u>18,603,000</u>

TABLE 10
HETCH HETCHY POWER SYSTEM
ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75
NET GENERATION						
Moccasin Powerhouse	493,702,900	531,070,800	533,978,200	542,886,200	554,418,600	539,122,000
Dion R. Holm Powerhouse	887,037,320	892,230,400	808,515,430	653,141,570	818,867,290	875,047,560
Robert C. Kirkwood Powerhouse	615,542,120	630,874,100	614,151,930	601,147,890	616,788,400	640,097,630
Subtotal	1,996,282,340	2,054,175,300	1,956,645,560	1,797,175,660	1,990,074,290	2,054,267,190
SUPPLEMENTAL ENERGY						
"Bank" Withdrawal*	191,365,500	133,964,745	46,360,466	0	36,435,281	123,458,969
Purchase (PG&E)	0	46,097,953	108,734,434	351,288,448	44,401,773	0
Subtotal	191,365,500	180,062,698	155,094,900	351,288,448	80,837,054	123,458,969
TOTAL	<u>2,187,647,840</u>	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>	<u>2,070,911,344</u>	<u>2,177,726,159</u>
DISTRIBUTION						
Sales						
Municipal Accounts	427,168,499	458,127,155	478,105,789	508,259,909	482,482,697	481,275,895
Modesto Irrigation Dist.	637,972,000	728,371,000	796,740,000	858,816,000	787,392,000	734,880,000
Turlock Irrigation Dist.	271,156,800	321,456,000	360,619,200	421,484,000	302,784,000	219,120,000
Kaiser Cement & Gypsum	168,705,080	152,736,000	152,127,205	145,368,000	156,720,000	143,688,000
Kaiser Aluminum & Chemical	39,240,000	39,549,000	33,996,000	31,521,600	31,320,000	28,137,600
Norris Industries, Inc.	35,721,216	24,033,485	17,664,768	22,325,760	22,502,016	21,695,155
Hercules, Inc.	92,844,000	94,662,000	57,906,000	---	---	---
California Ammonia Co.	103,020,000	104,280,480	80,876,760	---	---	---
Air Products & Chemicals	34,617,984	32,653,056	---	---	---	---
Valley Nitrogen Producers	124,884,480	108,631,560	---	---	---	---
Lockheed Missiles	---	---	---	---	---	---
General Motors	---	---	---	---	---	---
IBM Corporation	---	---	---	---	---	---
Liquid Air, Inc.	---	---	---	---	---	---
Miscellaneous Customers	664,093	745,614	759,065	847,858	733,633	809,002
Non-Revenue						
Project Use	3,744,004	4,101,136	4,287,512	4,003,796	3,266,691	3,264,541
"Bank Deposit"*	135,151,010	47,826,652	9,756,928	28,985,698	130,908,552	33,771,707
Losses	<u>112,758,674</u>	<u>117,064,260</u>	<u>118,901,233</u>	<u>126,851,487</u>	<u>113,244,955</u>	<u>115,615,447</u>
TOTAL	<u>2,187,647,840</u>	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>	<u>2,070,911,344</u>	<u>2,177,726,159</u>

*In accordance with letter - agreement between City and PG&E dated June 24, 1975.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENSITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1974-75

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER +OVER</u>
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 152,659	\$ 141,444	\$ -11,215
111	Allowance for Overtime	500	488	-12
112	Holiday Pay	400	400	-0
200	Contractual Services	1,165	1,268	103
231	Lighting and Heating of Public Buildings - General	1,450,000	1,513,579	63,579
231-1	Lighting and Heating of Public Buildings - Special Fund	5,025,781	4,358,172	-667,609
231-2	Lighting of Public Streets - Pacific Gas and Electric Co.	580,000	585,670	5,670
231-3	Lighting of Public Streets - Hetch Hetchy	483,000	472,059	-10,941
231-4	Lighting of Public Streets - Calif. Division of Highways	1,200	1,200	-0
300	Materials and Supplies	460	460	-0
400	Equipment	1,129	1,006	-123
813	Auto Insurance	257	212	-45
860	Retirement Allowance	27,017	27,017	-0
862	Social Security	6,675	4,993	-1,682
865	Health Service System	5,489	3,843	-1,646
954	EDP - PUC Data Processing	12,000	12,000	-0
TOTAL		<u>\$7,747,732</u>	<u>\$7,123,811</u>	<u>\$ -623,921</u>
<u>RECEIPTS</u>				
Interfund Receipts*		\$6,151,586	\$5,882,994	\$ -268,592
Ad Valorem Taxes		1,596,146	1,240,817	-355,329
		<u>\$7,747,732</u>	<u>\$7,123,811</u>	<u>\$ -623,921</u>
<u>WORK ORDER APPROPRIATIONS FROM ROAD FUND</u>				
	<u>DESCRIPTION</u>	<u>TOTAL FUNDS</u>	<u>EXPENDITURE</u>	<u>-UNDER +OVER</u>
	Maintenance and Repair of Street Lighting Installations	\$ 218,550	\$ 217,821	\$ -729

*Transfers from other Departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1974-75

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION KILOWATTHOURS</u>	<u>EXPENDITURES</u>
Adult Probation (a)	1	853	24
Art Museum	1	1,046,400	11,748
Auditorium and Brooks Hall	1	4,509,600	48,707
Child Care Centers	11	264,860	6,162
City Planning	1	74,220	1,531
DeYoung Museum	1	3,019,200	29,613
Disaster Corp.	1	78	1,802
Electricity	6	422,433	7,453
Farmer's Market	1	23,052	548
Fire	58	2,880,800	59,829
Hassler Health Home	1	214,800	3,204
Health	36	16,366,466	157,324
Hetch Hetchy	6	128,410	3,477
Hidden Valley Ranch	1	882,720	10,385
International Airport (b)	6	189,915,674	1,588,328
Junior College District	24	7,566,120	81,910
Juvenile Hall	3	1,426,619	14,791
Legion of Honor	1	512,400	6,730
Library	31	2,753,996	45,543
Log Cabin Ranch	13	367,668	10,293
Municipal Railway	38	64,798,906	648,589
Parking Authority	18	170,489	4,133
Police	15	897,072	18,173
Public Building	9	15,038,816	133,734
Public Works	103	26,311,259	326,288
Purchasing	5	486,490	7,385
Real Estate	2	390,160	7,211
Recreation and Park	207	10,194,511	177,366
Recreation and Park - Candlestick Park	2	2,182,440	49,102
Recreation and Park - Yacht Harbor	32	1,309,606	28,239
Sheriff	3	1,323,940	13,918
Social Services	5	996,526	13,575
Street Lighting Operations (.003)	1	45,824,647	472,059
Unified School District	228	30,681,335	484,912
War Memorial	1	1,336,000	16,611
Water	<u>126</u>	<u>43,961,713</u>	<u>395,726</u>
 TOTAL MUNICIPAL DEPARTMENTS	 999	 478,280,279	 4,886,423
 Academy of Sciences	 2	 2,680,220	 24,822
State of California: Street Lighting	1	(c)	12,614
Traffic Devices	<u>1</u>	<u>315,396</u>	<u>6,236</u>
 GRAND TOTAL FROM HETCH HETCHY	 1,003	 481,275,895	 4,930,095

Notes: (a) Account Closed

(b) Includes 147,431,772 KWH resold at Commercial rates for 1,288,848 to Airport tenants

(c) Included under Street Lighting Operations.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS AND STEAM FOR MUNICIPAL PURPOSES
FISCAL YEAR 1974-1975

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURES</u>
Adult Probation (a)	1	88	13
Auditorium and Brooks Hall	2	886	128
Child Care Centers	10	31,060	3,578
City Planning	1	5,700	637
DeYoung Museum	1	271,425	28,970
Electricity	2	62,970	6,662
Farmer's Market	1	688	91
Fire	55	671,952	72,391
Hassler Health Home	3	30,746	3,320
Health	31	4,906,557	465,447
Hetch Hetchy	2	1,202	182
International Airport	5	1,687,870	161,397
Junior College District	15	852,291	91,251
Juvenile Hall	4	430,218	45,750
Legion of Honor	1	63,532	6,823
Library	28	107,438	12,283
Municipal Railway	11	308,095	32,898
Police	11	42,351	4,836
Public Buildings	5	1,291,707	129,595
Public Works	15	287,570	36,365
Purchasing	3	61,918	6,892
Real Estate	1	19,025	1,917
Recreation and Park	106	1,310,688	141,471
Recreation and Park - Candlestick Park	1	116,797	12,383
Registrar of Voters	1	6,133	700
Sheriff	3	384,937	41,675
Single Men's Rehabilitation Center	1	36,523	3,894
Social Services	4	67,076	8,804
Unified School District	218	4,523,886	491,249
War Memorial	3	247,697	26,800
Water	<u>11</u>	<u>155,270</u>	<u>17,128</u>
TOTAL MUNICIPAL DEPARTMENTS	556	17,984,305	1,855,530

STEAM

(Does not include steam generated by City)

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION POUNDS</u>	<u>EXPENDITURE</u>
Social Services (a)	1	610,200	1,475

Notes: (a) Accounts closed.

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTS IN SERVICE
JUNE 30, 1975

<u>SIZE AND TYPE OF LAMP</u>	<u>COMPANY- OWNED</u>	<u>JOINTLY- OWNED</u>	<u>CITY- OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTION</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500-Lumen Incandescent	248	24	73	345
4,000-Lumen Incandescent	1,028	127	1,537	2,692
6,000-Lumen Incandescent	569	453	3,033	4,055
10,000-Lumen Incandescent	443	18	545	1,006
23,000-Lumen Fluorescent	---	---	---	---
400-Watt Mercury Vapor	3	45	170	218
1,000-Watt Mercury Vapor	---	---	3	3
175-Watt Mercury Vapor	---	---	10	10
250-Watt Mercury Vapor	2	---	---	2
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	107	107
2,500-Lumen Incandescent	12	4	58	74
4,000-Lumen Incandescent	178	2	104	284
6,000-Lumen Incandescent	36	5	85	126
10,000-Lumen Incandescent	10	---	14	24
5,500-Lumen Fluorescent	---	---	38	38
23,000-Lumen Fluorescent	38	---	4	42
100-Watt Mercury Vapor	---	---	112	112
175-Watt Mercury Vapor	44	---	3,430	3,474
250-Watt Mercury Vapor	37	---	1,002	1,039
400-Watt Mercury Vapor	304	---	4,565	4,869
700-Watt Mercury Vapor	---	---	364	364
1,000-Watt Mercury Vapor	---	---	135	135
400-Watt Lucalox	---	---	321	321
<u>OVERHEAD CONNECTION</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	1	---	---	1
4,000-Lumen Incandescent	28	---	42	70
6,000-Lumen Incandescent	---	---	---	---
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	9	---	---	9
4,000-Lumen Incandescent	52	---	7	59
6,000-Lumen Incandescent	8	---	1	9
175-Watt Mercury Vapor	14,705	---	2	14,707
250-Watt Mercury Vapor	1,954	---	---	1,954
400-Watt Mercury Vapor	890	---	---	890
TOTAL, JUNE 30, 1975	<u>20,599</u>	<u>700</u>	<u>15,762</u>	<u>37,061</u>
	55.6%	1.9%	42.5%	100%
TOTAL, JUNE 30, 1974	20,725	707	15,559	36,991
NET CHANGE DURING THE YEAR	-126	-7	+203	+70

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1974-1975

CONTRACTUAL SERVICE

PGandE Company

Company-owned facilities (a)	829,962		
Jointly-owned facilities (a)	34,898		
City-owned facilities (b)	131,852	996,712	
Less deduction for energy component		411,041	585,671
Emergency service to City-owned facilities			4,902

Lease-Lite Corporation

Group lamp replacement - City-owned facilities			58,545
--	--	--	--------

Mahoney Electric

Maintenance and repair - City-owned facilities			
Routine maintenance		47,176	
Repair of damage caused by accidents (c)		34,860	
Repair of damage caused by equipment failure		38,002	
Repair of damage caused by vandals		1,977	122,015

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)		25,872	
Damage caused by equipment failure		11,418	
Damage caused by vandals		845	38,134

ELECTRIC ENERGY (HETCH HETCHY)

45,823,986 kwh @ \$0.01345 less 21% discount			486,903
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TOTAL EXPENDITURE			<u>1,296,170</u>
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LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway routes	12,614		
Recreation and Park Dept. for off-street lighting	2,240		14,854

TOTAL NET EXPENDITURE			<u><u>1,281,316</u></u>
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AVERAGE OPERATING COST

Based on number of lights in service June 30, 1975, average total cost of operation, maintenance and repair per light per year:	<u><u>34.57</u></u>
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- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamps and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16

BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS

COMPLETED DURING FISCAL YEAR 1974-1975

<u>Locations</u>	<u>Number of Lights</u>	<u>Type of Lights*</u>	<u>Value</u>
Financed by Bond Issues:			
Powell and Stockton Streets	35	M	\$ 50,905
Mission Area	<u>56</u>	M	<u>72,210</u>
TOTALS	91		\$ 123,115
Financed by State Gasoline Tax:			
Geary Blvd. Underpass at Masonic Ave.	58	M	\$ 47,275
Webster Street--Bush Street to Geary Blvd.	22	M	66,314
Various Location, Cable Car Route	6	M	10,143
Army Street Circle Channelization - Contract 3	53	M	53,000
San Jose Avenue, Highland Avenue Bridge	7	M	6,600
Various Safety Problem Location, Traf. Sigs. Cont. 2	5	M	8,393
Washington Street-Montgomery to Sansome Streets	7	M	9,820
Keith Street-Fairfax to Evans Avenues	2	M	7,005
Griffith Street and Oakdale Avenue	2	M	8,098
Midtown Terrace	45	M	62,580
Rivera Street-14th Avenue to Funston Avenue	2	M	6,811
Redevelopment Area D-1, Y.B., New Street No. 4	3	M	5,000
Minnesota Street-So. 22nd Street	<u>2</u>	M	<u>6,279</u>
TOTAL	213		\$ 297,318
GRAND TOTAL	304		<u>\$ 420,433</u>

* M-Mercury Vapor

TABLE 17
BUREAU OF LIGHT, HEAT AND POWER
HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to							
July 1, 1953	\$ 1,748,675	\$ 617,115	-	\$ 576,404	\$ 22,650	\$ 477,651	\$ 3,442,495
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	155,727	30,817	-	748	16,578	543	204,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	538	182,762
1959-60	-	100,126	-	35,874	10,242	4,083	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	474,673	\$ 522,899	-	-	-	997,572
1966-67	-	111,164	188,312	5,000	-	-	304,476
1967-68	-	175,949	331,941	-	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	-	1,031,201
1969-70	-	359,635	261,000	-	-	-	620,635
1970-71	-	490,031	1,550,442	-	-	-	2,040,473
1971-72	-	541,534	1,810,011	-	-	-	2,351,545
1972-73	-	451,614	-	-	-	-	451,614
1973-74	-	266,764	236,314	-	-	-	503,078
1974-75	-	297,318	123,115	-	-	-	420,433
TOTALS	\$ 2,178,926	\$ 5,393,189	\$ 5,640,756	\$ 878,534	\$ 197,350	\$ 498,275	\$ 14,787,030
Less: Cost of portions removed prior to fiscal year 1973-74						\$1,646,673	
Cost of portions removed during fiscal year 1974-75						74,449	
Original cost of City-owned facilities in service on June 30, 1975							\$ 1,721,122
							\$ 13,065,908

* Includes WPA and PWA (1935-1942). Boulevard Construction (1932-1934), Municipal Railway, Recreation and Park Department and Housing Authority.

HETCH HETCHY WATER AND POWERCONSTRUCTION CONTRACTSFISCAL YEAR 1974-75

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Started</u>	<u>Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-471	Replace, Repair and Paint Trolley Poles on Mission Street	Abbett Electric Corp.	1-7-74	8-20-74	30,021	13,940
HH-480	Construct Paint Room at Moccasin Shops	George Reed, Inc.	9-23-74	1-20-75	37,800	37,800
HH-483	Exterior Painting and Roof Preservative at Moccasin and Tesla Portal Buildings	Ross F. Porter Quality Painting	10-7-74	6-27-75	33,190	33,190
HH-484	Replace Interior Lighting System at O'Shaughnessy Dam	City Appliances & Electric	8-5-74	5-6-75	45,000	45,000
HH-489	Construct Manhole and Ducts 2nd and Mission Streets	John H. Thomas & Son	7-15-74	8-26-75	12,792*	12,992
HH-491	Construct Underground Power Facilities, Fillmore Street, Pine to Hayes	Abbett Electric Corp.	12-9-74	-	737,618*	551,232
HH-492	Construct Underground Duct System, Market Street - 7th to 8th	Underground Construction Co., Inc.	5-13-74	9-9-75	146,306*	100,921
HH-493	Construct Underground Duct System, 19th Ave. and MUNI Right-of-Way	Underground Construction Co., Inc.	5-13-74	7-17-75	172,366*	21,320
HH-496	Construct Underground Duct System, Ecker and Stevenson Street	Underground Construction Co., Inc.	10-7-74	2-11-75	100,398*	100,398
HH-498	Construct Underground Duct System, West Portal Ave. & Taraval Street, St. Francis Circle to 20th Ave.	Underground Construction Co., Inc.	3-17-75	5-20-75	230,027*	216,238

TABLE 18 (Cont'd)

HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1974-75

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
HH-499R	Re-Roof Cottages at Moccasin and Early Intake	Hulser Roofing Company	2-10-75	6-16-75	30,178	30,178
HH-501	Repair - Weatherproof Buildings at Moccasin	Hetch Hetchy	12-7-74	-	9,790	9,790
HH-502	Construct Underground Duct System, Ocean Ave., Junipero Serra Blvd. to Harold Ave.	Ameico Electric	2-17-75	-	196,148*	115,324
HH-509	Moccasin-Newark Transmission Line, Paint Steel Towers	M.B. Painting Inc.	1-6-75	4-2-75	56,890	56,890
HH-512	Install New Piping and Repair San Joaquin River Valve House	Vetter Plumbing Co., Inc.	3-10-75	-	7,229	-
HH-513	Paint Holm Powerhouse Penstock	M.B. Painting, Inc.	5-1-75	-	33,400	27,483
HH-516	Repair Roof - Storage Shed at 1401 Bryant Street	J.M. Construction	12-23-74	1-20-75	4,470	4,470
HH-519	Construct Underground Duct System, 19th Ave., Randalph and Broad Sts.	Ventruini Corp.	5-5-75	-	179,780*	68,081
HH-520	Paint Steel Trolley Poles on Haight Street between Stanyan St. and Central Ave.	J. Wm. Sorenson, Inc.	4-28-75	5-20-75	4,320	4,320
Emerg.	Repair Leak - San Joaquin Pipeline No. 3	Hetch Hetchy	2-26-74	-	45,000	10,174
DPW #23,476	Construct Underground Duct System and Re-route No.5 Trolley Line, United Nations Plaza	Homer J. Olsen, Inc.	3-27-75	-	92,623*	25,300

TABLE 18 (Cont'd)

HETCH HETCHY WATER AND POWERCONSTRUCTION CONTRACTS
FISCAL YEAR 1974-75

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
DPW #23,506	Construct Underground Duct System, Judah Street	Homer J. Olsen, Inc.	6-10-74	-	355,281*	319,701
MR-595R	Construct Underground Duct System, Junipero Serra Blvd.	Homer J. Olsen, Inc.	11-4-74	-	68,640*	55,545
BARTD 1S3026	Civic Center Substation	Northwest Construction Co.	3-26-73	6-30-75	446,700	68,003
BARTD 1S0032	Church Street Substation	Fruin-Colnon Corp., Dravo Corp., & Rothschild & Raffin, Inc.	11-17-72	-	258,240	55,056
Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year						<u>\$1,983,346</u>

* Includes City Furnished Manhole Frames & Covers @ \$272.30 ea.

1975 ANNUAL REPORT 1976



O'SHAUGHNESSY DAM

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HETCH HETCHY WATER AND POWER

PUBLIC UTILITIES COMMISSION
CITY AND COUNTY OF SAN FRANCISCO

CITY AND COUNTY OF SAN FRANCISCO
PUBLIC UTILITIES COMMISSION

A N N U A L R E P O R T
FISCAL YEAR 1975-76

HETCH HETCHY WATER AND POWER SYSTEM
AND
BUREAU OF LIGHT, HEAT AND POWER

O. L. MOORE
GENERAL MANAGER

CITY AND COUNTY OF SAN FRANCISCO

GEORGE R. MOSCONE - MAYOR

PUBLIC UTILITIES COMMISSION

JOHN F. HENNING, Jr.	President
DENNIS V. CAREY	Vice President
H. WELTON FLYNN	Commissioner
JOSEPH P. BYRNE	Commissioner
LYDIA LARSEN	Commissioner
JOHN D. CROWLEY	General Manager

ANNUAL REPORT
FISCAL YEAR 1975-76

HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to Hetch Hetchy employees, past and present, whose devoted and conscientious efforts have made possible these accomplishments for San Francisco.

The picture on the front cover of O'Shaughnessy Dam was taken on June 7, 1923, before the dam was raised an additional 85.5 feet.

In the 75th year since the first lands were acquired for the Hetch Hetchy Water and Power system, and in the midst of a very dry year, it is fitting to recognize the foresight, industry and dedication of the people who conceived, built and operate that system. One and three-quarter million San Francisco Bay Area residents receive a supply of first quality water from Hetch Hetchy. How did it all come about?

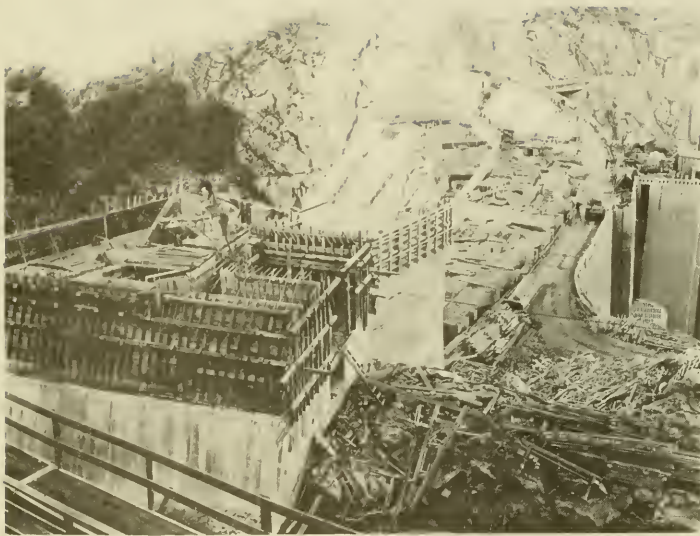
The Metropolitan Bay Area of 1901 consisted of a San Francisco of 350,000 population, and a collection of small, quiet towns around the Bay. Booming growth, a high level of civic pride, and the belief of every citizen that San Francisco was to be the leading metropolis of the Pacific Coast were the keynotes of the times.

Some dissatisfaction with the commercial supplier, the Spring Valley Water Company, prevailed, occasioned by high rates, periodic shortages and recurring water quality problems. That dissatisfaction had prompted language in the Charter enacted in 1900, setting as a goal the acquisition and construction of a municipally owned water supply system. What was needed was a plentiful, high-quality water source that would meet the area's need for at least 100 years. Looking east to the Sierra Nevada, the planners found such a source in Yosemite National Park. But the water was 150 miles away!

The "City that knows how" was determined that the water system would be built, and the first land was purchased, and water rights established, in 1901. The ensuing struggle for permission to build a dam in Hetch Hetchy valley went on for years. When the United States Congress confirmed the City's right to proceed in 1913, construction commenced on the largest such project on the Pacific Coast up to that time. After 21 years, and the expenditure of some \$100 million, the first water arrived at Crystal Springs Reservoir via the Hetch Hetchy aqueduct in 1934. The drama surrounding the leadership, politics, and the engineering and construction effort involved in the project would be worthy of an epic novel, as expansion of the system to meet water and power demand continues down to the present.

The large and complex system was designed to be built in increments as demand increased. The master plan concept of a full gravity aqueduct system to Crystal Springs, established in 1912, has been followed as the system has grown through the years to the present capacity of 300 million gallons daily. As a by-product of the falling water, hydroelectric generating capability of 340 megawatts has been constructed; a major economic asset for San Francisco. Additional elements of the system are planned for construction as the demand increases.

Today, the benefits of the Hetch Hetchy project are so matter-of-factly accepted that the public has granted the system its highest accolade: cheap, pure and plentiful water is taken for granted!



The last concrete in the original O'Shaughnessy Dam construction was poured in April, 1923, bringing the total to 398,000 cubic yards. The height of the dam was 226.5 feet above the original streambed and 344.5 feet from the bottom of the foundation. It was 298 feet thick at the base and 15 feet at the top. At the time it was constructed, it was the second highest dam in the United States, Arrowrock in Idaho winning by ten feet. Between 1934 and 1938 it was raised an additional 85.5 feet.

HIGHLIGHTS

Financially, the outcome of Hetch Hetchy's Water and Power system operation for 1975-76 was influenced by two major events which occurred during the year - one man-made and the other the result of a natural occurrence.

Breakdown of wage negotiations for the upcoming fiscal year between City's crafts workers and the Board of Supervisors resulted in a 38-day strike by City employees including electricians, plumbers, carpenters, laborers, street cleaners, etc. who are members of the crafts union. The strike began March 31, 1976 and ended on May 8, 1976. The public transit system was quickly brought to a halt when the Municipal Railway drivers joined the strike at the very outset. The importance of the Hetch Hetchy Water and Power system operation to the success or failure of the strike was not to be overlooked. It, too, was forced to shut down with all hydroelectric generators stopping production at 1400 hours on April 2, followed by complete cessation of water delivery to the San Francisco Water Department for domestic purposes.

The drought brought on by the lack of precipitation in the winter of 1975-76, resulting in the smallest snow melt runoff from the Hetch Hetchy, Cherry and Eleanor Watersheds in the 59 years of record, has left the three reservoirs at less than 60% full at the end of the report year. In order to conserve as much water as possible for domestic use in the Bay Area, the average daily power draft at Kirkwood and Moccasin Powerhouses beginning June 1, 1976, was reduced to 300 million gallons per day to coincide with the Hetch Hetchy Aqueduct capacity and the anticipated San Francisco Water Department demand for the next several months. In addition, the power draft at Holm Powerhouse was reduced to 200 cubic feet per second in order to conserve water at Lake Lloyd so that, if later conditions require, such water can be directed into the Hetch Hetchy Aqueduct.

HETCH HETCHY ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, the HETCH HETCHY WATER AND POWER DEPARTMENT and the BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.

Through its Transit Power Division, Hetch Hetchy has funded, operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Railway since July 1, 1969.

In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Overhead Lines and Motive Power Sections of the Municipal Railway.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design and construction of City-owned street lighting improvements are under the jurisdiction of the Department of Public Works, and plans for these improvements must be approved by the Public Utilities Commission through this Bureau. The Bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1975-76, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>Number of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	219	\$ 21,350,716
Hetch Hetchy Water and Power (Transit Power Division)	52	4,505,194
Bureau of Light, Heat and Power	<u>11</u>	<u>9,493,990</u>
	282	\$ 35,349,900



O'Shaughnessy Dam as it looks now.

PLANS FOR THE NEAR FUTURE

Plans for future Hetch Hetchy construction are included in the City's current Capital Improvement Plan.

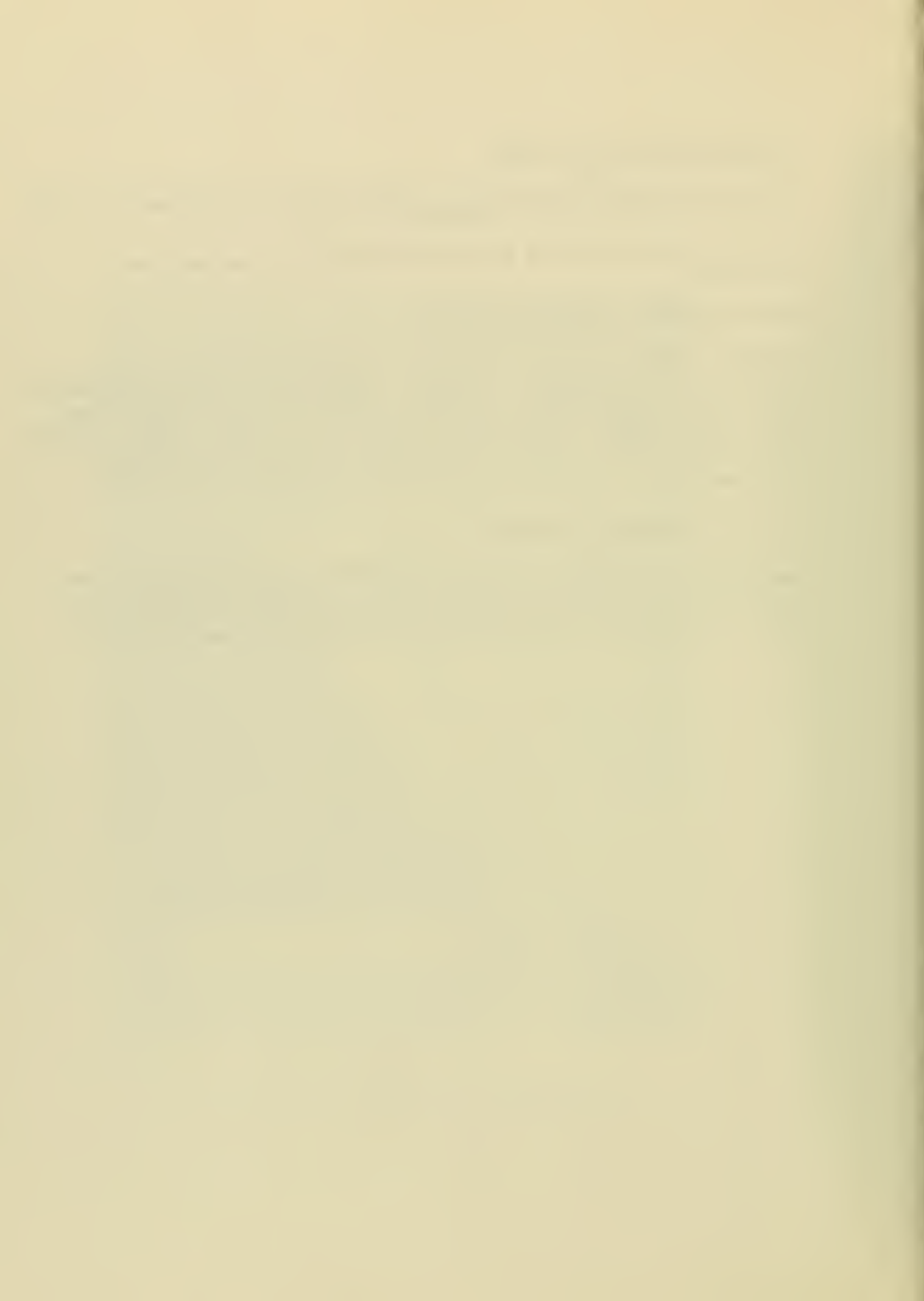
Projects which will be added next year will include the following:

Cherry Eleanor Pumping Station

We have studied the possibility of installing pumps at the Cherry end of the Cherry Eleanor Tunnel. This study determined that it was economically feasible to capture, for electrical generation, water which presently spills at Lake Eleanor during the runoff season. Preliminary design work will commence this year, while the necessary permits and approvals are being obtained.

Moccasin Powerhouse Bypass

Studies are planned to make improvements on Rattlesnake Creek and Big Jackass Creek to permit the discharge of water from Priest Reservoir into the Hetch Hetchy Aqueduct for use in times of emergency when Moccasin Powerhouse is not operative.



HETCH HETCHY WATER AND POWER SYSTEM

REVENUE AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and seven industrial customers.

Kaiser Cement & Gypsum Corporation	Santa Clara County
Kaiser Aluminum & Chemical Corporation	Santa Clara County
Lockheed Missiles and Space Company, Inc.	Santa Clara County
General Motors Corporation	Alameda County
IBM Corporation	Santa Clara County
Liquid Air, Inc.	Alameda County
Norris Industries, Riverbank	Stanislaus County

2. Sale of water to the San Francisco Water Department.

POWER SALES

Gross sale of electric energy amounted to \$20,224,183, up from \$18,484,718 during 1974-75. Although this revenue appears to be a new record, it does not have the same significance as the record revenue of last year. The reasons are not so obvious without knowing the following:

- (1) Much of the increase is due to the very large amount of supplementary power and energy which City had to purchase for resale and which was resold to the customers at substantially the same high price at which it was purchased.
- (2) The offset to last year's record revenue in terms of expenditure for supplementary power and energy was only \$99,734, whereas this year the offset is \$4,389,319. Therefore, from the standpoint of net earnings, the department finds itself in a much less profitable financial position than that of last year.

Power and energy delivered to all City Departments increased 1.9% over the previous year, mainly the result of increased consumption at the San Francisco General Hospital where additional power for construction of the new facilities nearly doubled the total requirements of 11,091,942 kilowatthours for 1974-75. Consumption at the Airport, usually the single largest energy consumer among the City departments, has remained substantially the same as 1974-75. The requirements for the San Francisco Water Department have again increased 9.3%, reflecting

more pumping required by the drought condition. The Municipal Railway showed a decrease of 12.2% in annual consumption over the previous year, largely as a result of the Muni shutdown during the City employees' strike.

Power and energy delivered to Modesto Irrigation District, Hetch Hetchy's largest power customer, and to Turlock Irrigation District, the third largest, increased by 17.7% and 13.6% respectively this year. These increases in purchases clearly reflect the dry year operation of the Districts' own plant where power is derived from water stored behind Don Pedro Dam.

The hope of exceeding the record generation of 1974-75 was effectively shattered by the drought and the strike. Instead, the opposite was achieved with the lowest production recorded in seven years of operation of the present project. By comparison, the 1975-76 total output of 1,640,671,000 kilowatt-hours is 20% less than the record output of 2,057,609,000 kilowatthours for 1974-75.

Hetch Hetchy power is sold to City Departments at cost, representing a saving to taxpayers for 1975-76 of approximately \$3.2 million compared to the cost if supplied by the local investor-owned utility.

One of the benefits resulting from the June 24, 1975 Amendment Agreement with the Pacific Gas and Electric Company for wheeling Hetch Hetchy power to City's municipal customers was the reduction in energy which City has to supply to compensate the Company for losses incurred in transmission and distribution. The data for 1975-76 indicates that 33,248,681 kilowatthours was delivered to the Company for this purpose, almost 41,000,000 kilowatthours less than that required under the old agreements. This reduction in losses when sold to industrial customers at prices effective during the year returned to the City additional revenue in excess of \$650,000.

In last year's annual report, it was estimated that the new electric power rates which were scheduled to go into effect July, 1975 would increase Hetch Hetchy's power revenue for 1975-76 from sales to the municipal customers (including resale to Airport tenants) by one million dollars. Comparison of results for 1974-75 and 1975-76 has confirmed the accuracy of this prognostication. Another revision of the rates is scheduled for action by the Public Utilities Commission in July 1976. Adoption of the proposed rates will boost revenue from sales to private consumers and municipal users another \$900,000 in the upcoming fiscal year.

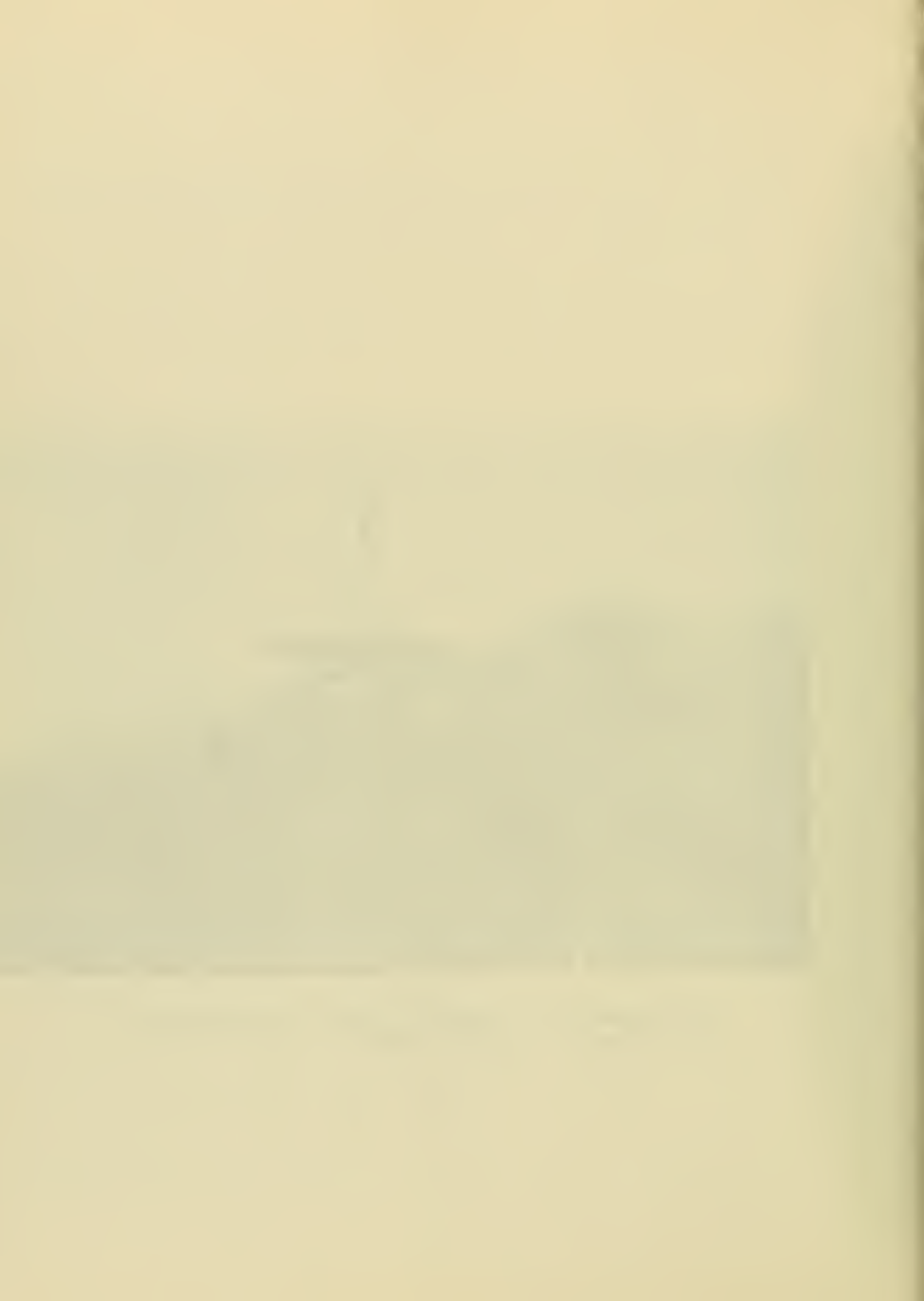
August 1975 marked the first month of higher rates for Hetch Hetchy power sold to the Modesto and Turlock Irrigation Districts under signed agreements with them dated May 22, 1973 and November 6, 1972 respectively.

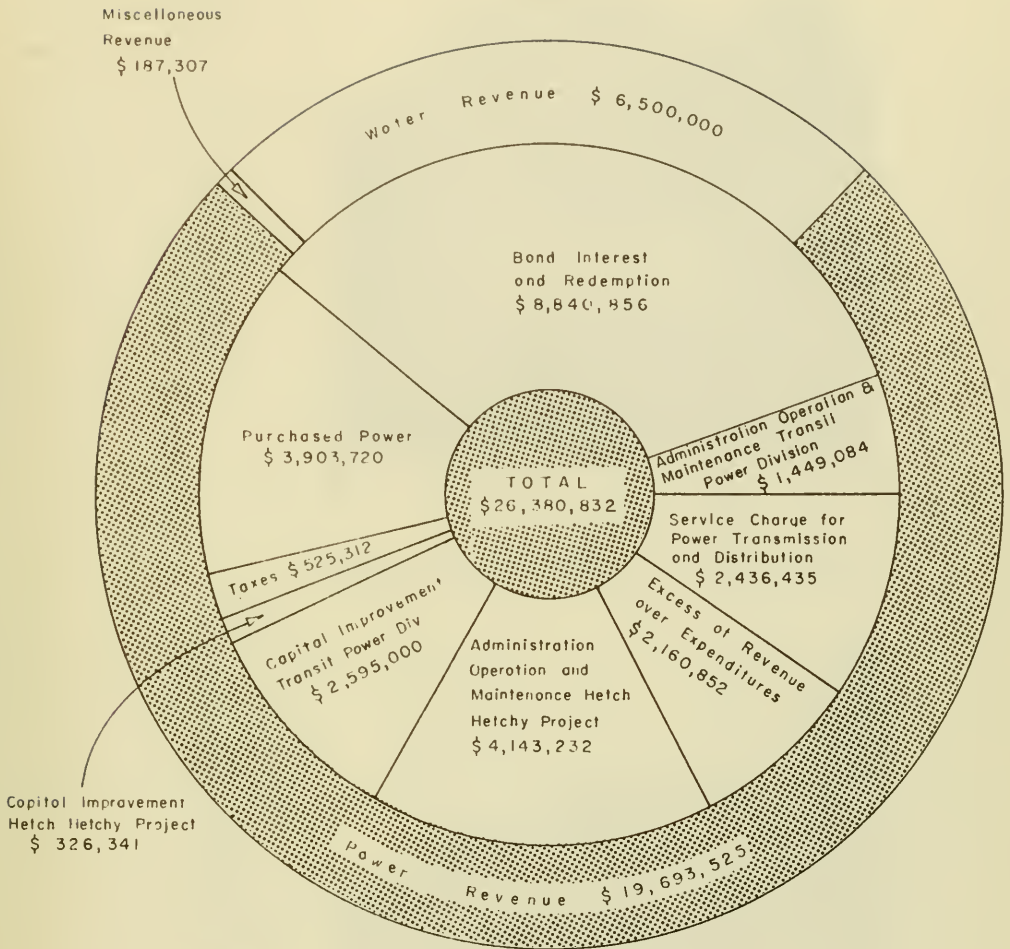
WATER SALES

This past year, revenue from sale of water and standby service to the San Francisco Water Department was \$6,550,000, \$428,000 less than cost to Hetch Hetchy.

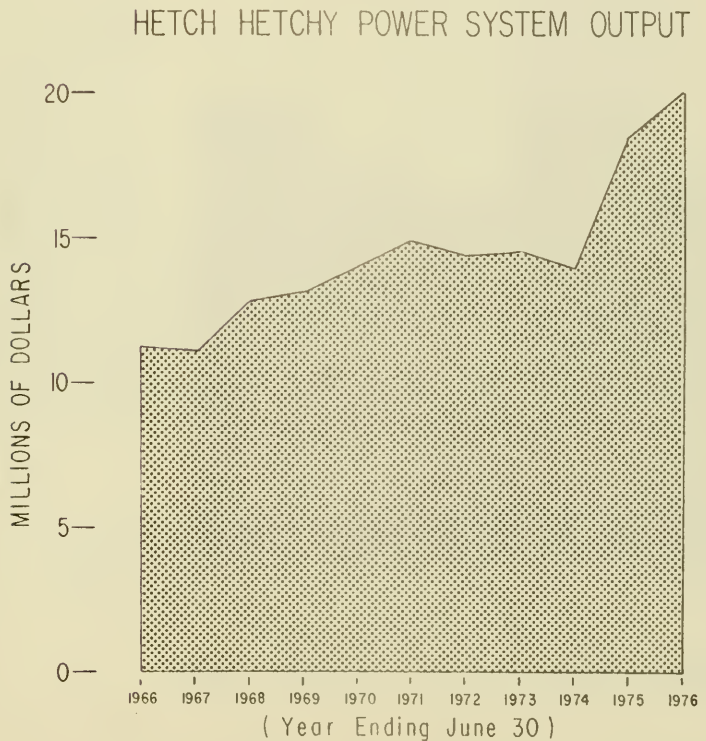
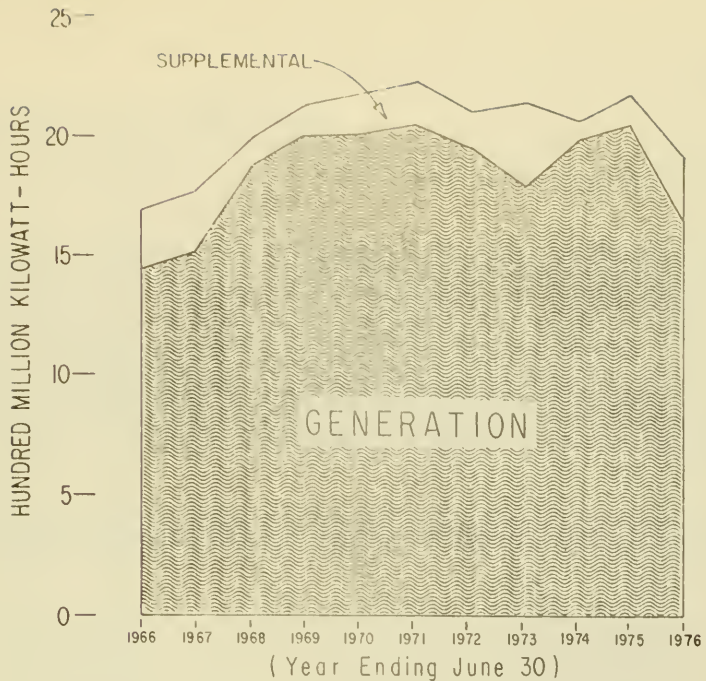


The Supervisors' inspection party on Red Mountain
Bar Cableway - July 14, 1927.





HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1975-76

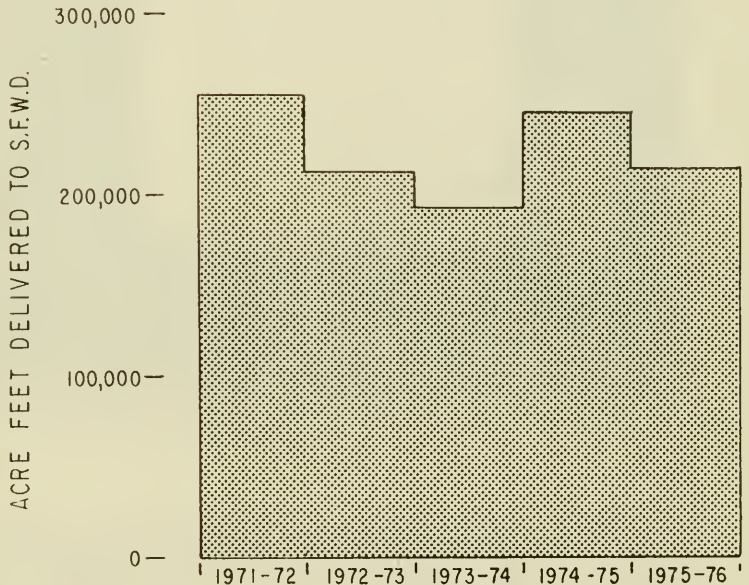


WATER PRODUCTION AND TRANSMISSION

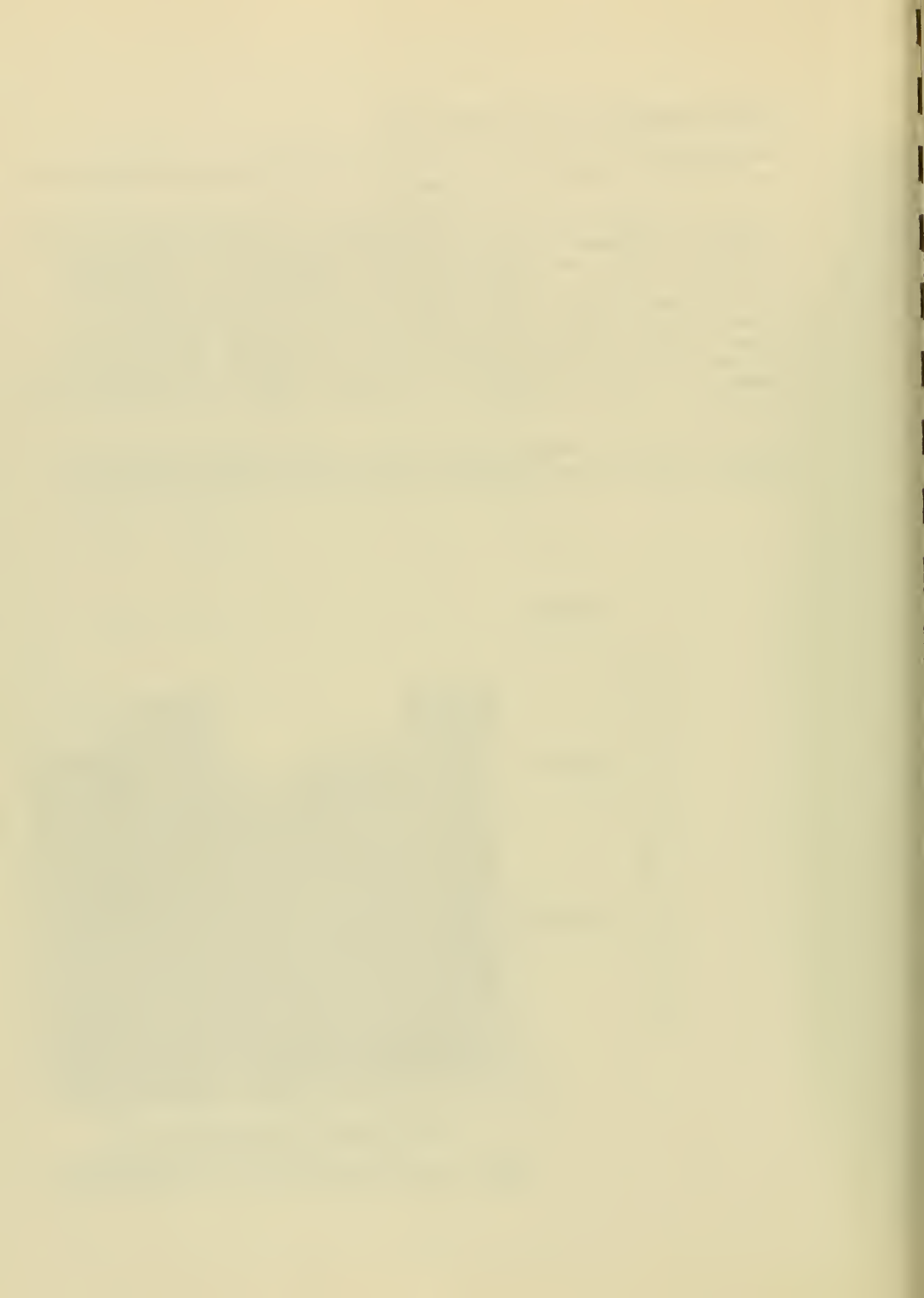
Precipitation recorded for the year at our measuring stations was 58% of the long term average.

During the year, 70,086,900,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 71% of the City's total customer consumption. In addition, 237,693,456 gallons were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 49,306,396 gallons were delivered to Groveland Community Service District in Tuolumne County from the Mountain Tunnel.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT





Woodrow Wilson, President of the United States, presented this plaque to the Honorable James Rolph, Jr., Mayor of San Francisco, expressing his support and enthusiasm for the Hetch Hetchy Act.

OPERATING AND MAINTENANCE - MOCCASIN DIVISION

HOLM POWERHOUSE UNIT NO. 2 GENERATOR

At approximately 0842 hours on Sunday, January 25, 1976, the 13,800 volt stator winding of Generator No. 2 at Dion R. Holm Powerhouse failed. Preliminary investigation indicated that approximately 8 of the 216 coils had been damaged. However, detailed examination following removal of the rotor assembly disclosed that a total of 16 coils would have to be replaced. Several of these coils were still functional, but dc high voltage testing showed that they would probably fail in a short time and were therefore deemed unacceptable for continued use. Portions of insulation on 4 field poles were also damaged by hot metal splatters from the stator windings when the failure occurred, requiring re-insulation of the affected area. All repair work was performed by departmental personnel, with supervision provided by the field engineers from Allis-Chalmers, the generator manufacturer. The repairs were completed and the generating unit returned to service by the middle of March.

A board of inquiry consisting of the senior electrical engineering staff members was formed to investigate the failure for cause and to recommend corrective measures. A final report is expected to include analyses and possible solutions to this maintenance problem whereby the reliability of the equipment can be improved.

CHERRY DAM HOLLOW JET VALVE REPAIRS

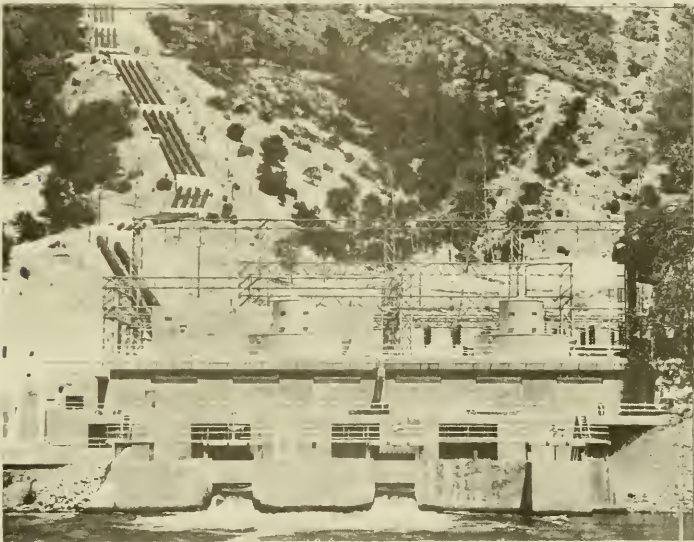
The Machine Shop repaired one of the two 60-inch valves used to release water from Lake Lloyd. The valve was leaking badly and water had gotten into the operating mechanism. If allowed to remain in place, it would have been necessary to replace the valve in a short period of time. It was necessary to build up and machine the body and plug seats, replace a brass bushing, a leather packing and two thrust bearings. Other miscellaneous repairs were made to broken or defective parts. The Mechanical Engineering Section provided engineering and procurement assistance to the Machine Shop, including inspection of work done to the plug seat by a local shop. At the end of the fiscal year, repairs were nearing completion and the valve will be available for use during the next runoff season.

LARNER JOHNSON RELIEF VALVE NO. 2 AT SAN JOAQUIN VALVE HOUSE

The relief valve on Pipeline No. 2 at the San Joaquin Valve House was removed from service during pipe cleaning and painting (III-511R). The machine shop used this time to completely rebuild the valve including braising and remachining the seats.



The old Moccasin Powerhouse completed June, 1925.



The new Moccasin Powerhouse completed May 20, 1969.

OPERATION AND MAINTENANCE - TRANSIT POWER DIVISION

The Transit Power Division is responsible for supplying the 600 volt direct current power that is necessary to operate the streetcars and trolley coaches of the San Francisco Municipal Railway.

The Transit Power Division is composed of two sections - the Motive Power Section and the Overhead Lines Section.

Motive Power Section

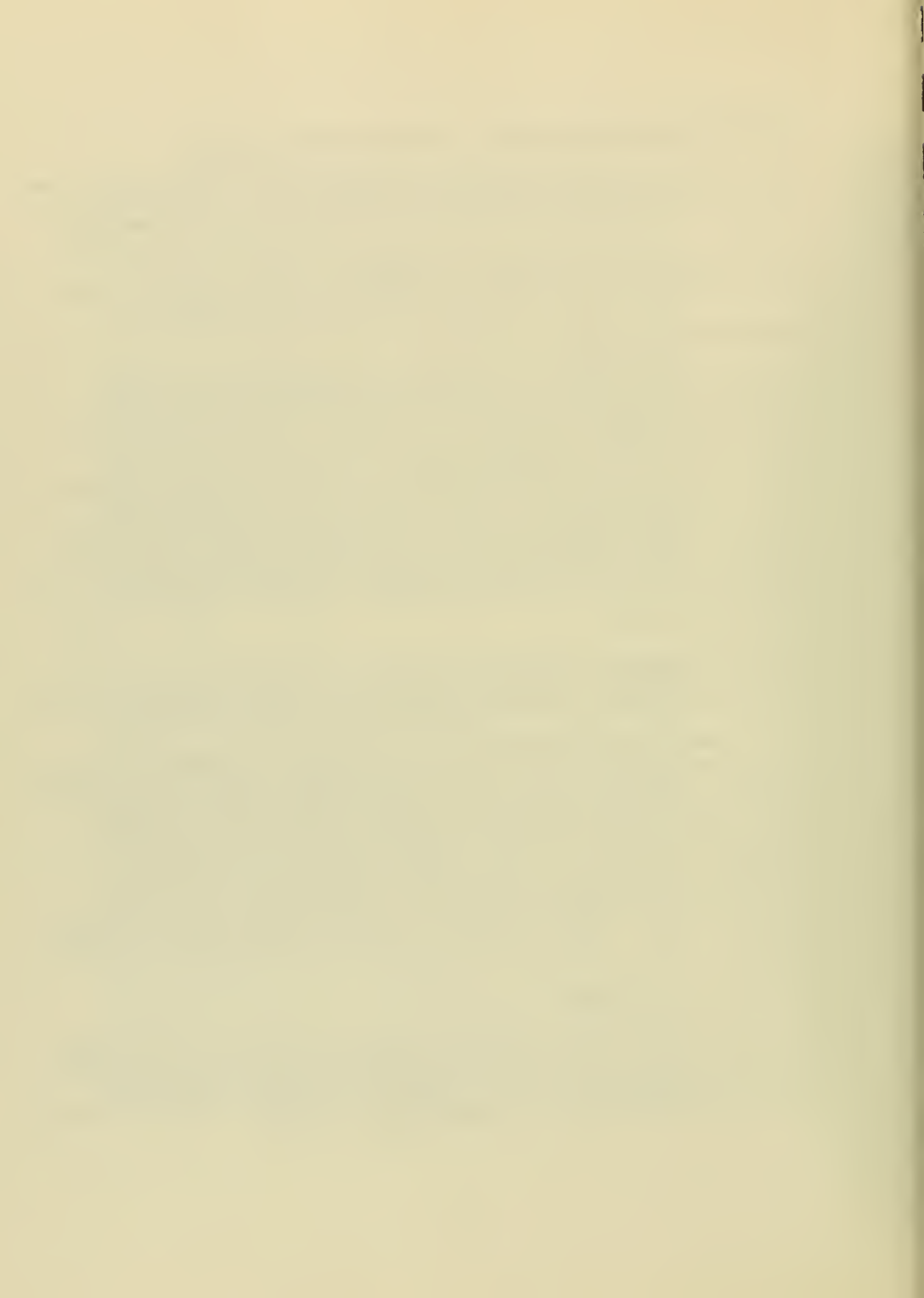
The Motive Power Section operates and maintains seven substations which convert electric power from 12,000 volts alternating current to 600 volts direct current by means of motor-generators, synchronous converters, and mercury arc rectifiers. (See Appendix Table 3 for statistical data.) Motive Power is also responsible for maintaining the electric motors and associated control equipment for operating the cable-winding machinery located in the Cable Car Powerhouse at Washington and Mason Streets. In addition, Motive Power does periodic inspection, cleaning, adjusting and repairing the streetcar and trolley coach recorders at Central Control of the Municipal Railway. The substations operate 24 hours per day, 365 days per year.

In anticipation of the need to assume responsibility for eighteen new substations, this section perused and commented on the wiring and control schemes proposed for these stations.

A new mimic board showing the new stations in schematic form was constructed and installed at the Bryant Substation. As new automatic stations are completed and become operational, they will be monitored and controlled from this remote location. Since Outer Mission and West Portal Stations are presently unmanned, controls for these stations were designed and installed on this new mimic board. This new status display and control board will continually be augmented with new automatic station controls until such time as it shall be superseded by a more sophisticated and flexible Supervisory Control System.

Overhead Lines Section

The primary function of the Overhead Lines Section is to maintain in satisfactory operating condition the trolley wire overhead facilities and the electric distribution system which conveys power to it. This electric distribution system consists of both overhead lines and underground cables.



Secondary functions include the maintenance of the Municipal Railway Signal Systems and the electric light and power systems of all Municipal Railway buildings.

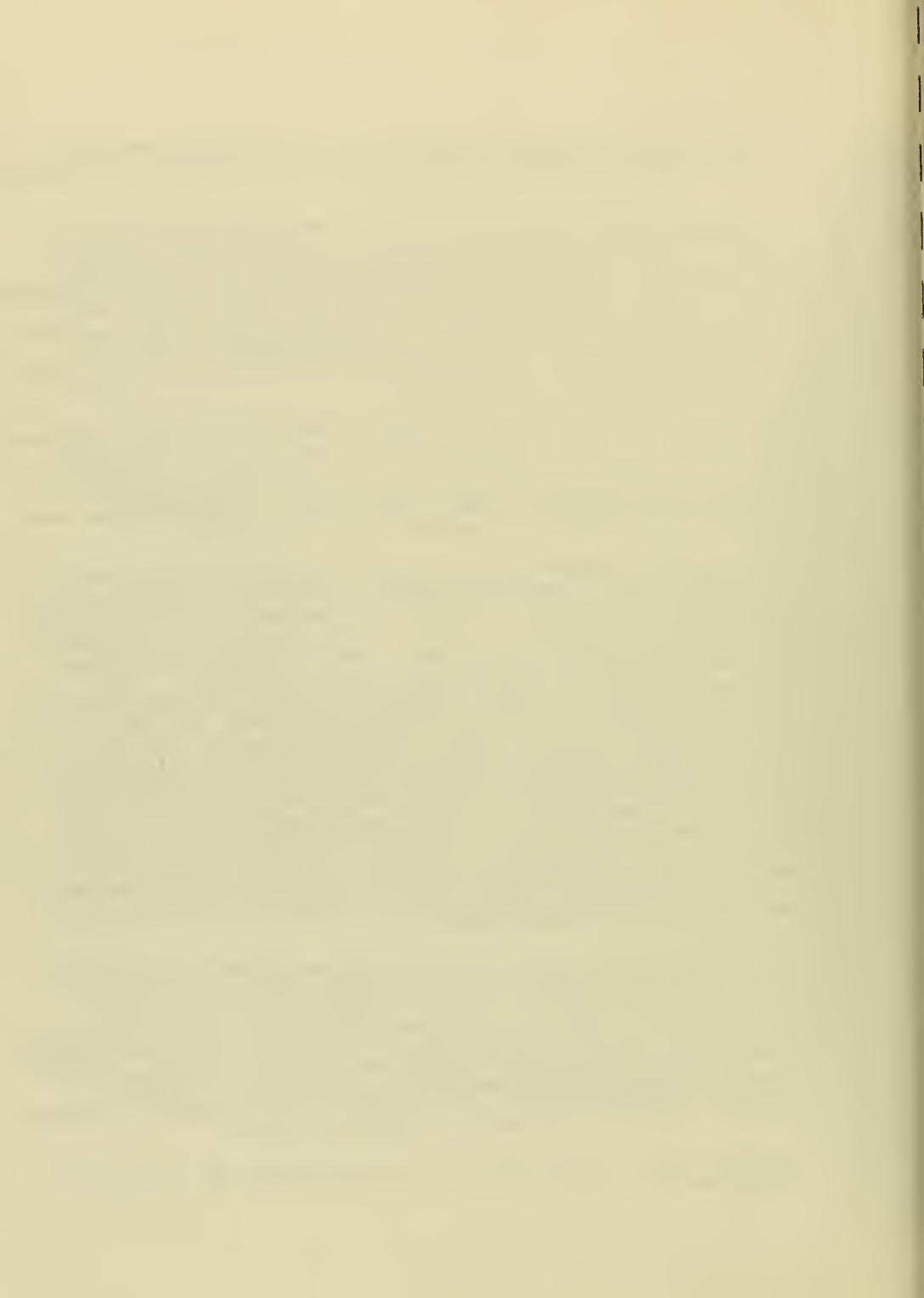
During the fiscal year 1975-76, the Overhead Lines Section responded to 3606 emergency calls. In addition to emergency calls, this section had a regular and extensive maintenance program for overhauling all overhead and underground facilities. This section operated with three shifts per day, seven days a week. Monday through Friday, the normal workday shift was from 8:00 a.m. to 3:30 p.m. with a two-man emergency crew on the "swing" or evening shift (3:30 p.m.-10:30 p.m.) and the graveyard shift (1:00 a.m.-8:00 a.m.).

On Saturdays, Sundays and holidays a two-man emergency crew was available on each of the three eight-hour shifts; midnight to 8:00 a.m., 8:00 a.m. to 4:00 p.m., and 4:00 p.m. to midnight. Overhead and underground facilities were systematically inspected, and worn or damaged parts were replaced before they could cause accidents or malfunction of equipment.

A considerable amount of damage to overhead facilities was caused by trolley coaches de-wiring and snagging their poles in the overhead facilities and tearing them down, or by breaking the spans with the flaying poles. Such damage was repaired at no cost to the Municipal Railway. Other parties who damaged our facilities were billed for the cost of repairs. This included damage to overhead facilities caused by high loads on trucks or careless operation of crane equipment and damage to underground feeder cables by contractors digging into our duct lines. During 1975-76, responsible parties were billed for 7 damage cases totalling \$3,728.53. The Overhead Lines Section also performed work for building owners and contractors under work orders amounting to 18 jobs totalling \$44,183.13. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily removing trolley wires and feeders to permit passage of high loads; and shifting of trolley wires and feeders for various excavations.

The Overhead Lines Section engaged in many other activities of a related nature which it is especially equipped to perform. These additional duties included repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car system; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.

In March 1976 the section curtailed operations for a six week period during a labor dispute involving city Craft workers.





Mr. O'Shaughnessy, City Engineer, inspecting project on August 11, 1918.

ENGINEERING DIVISION

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project and the Transit Power Division. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications. The Engineering Division is organized into five main sections: Structural and Civil, Electrical, Mechanical, Architectural, and Construction.

During the year, plans and specifications were prepared for the following work to facilitate and maintain Hetch Hetchy operations:

HH-454 - Reconstruct Moccasin Sewage Disposal System.

A package sewage treatment plant producing an odorless effluent and sludge has been planned to replace the existing septic tank system. This project is a carryover from last year due to the slowness to acquire approval for the Federal "Clean Water Grant" which we reapplied for last year. Conceptual approval has been received. The EIR and the Project Report received approval from the State Water Resources Control Board, and we are now awaiting Federal EPA approval. The Hughes site for the effluent sprinkler field was purchased during the year.

HH-477 - Moccasin Penstock Valve House.

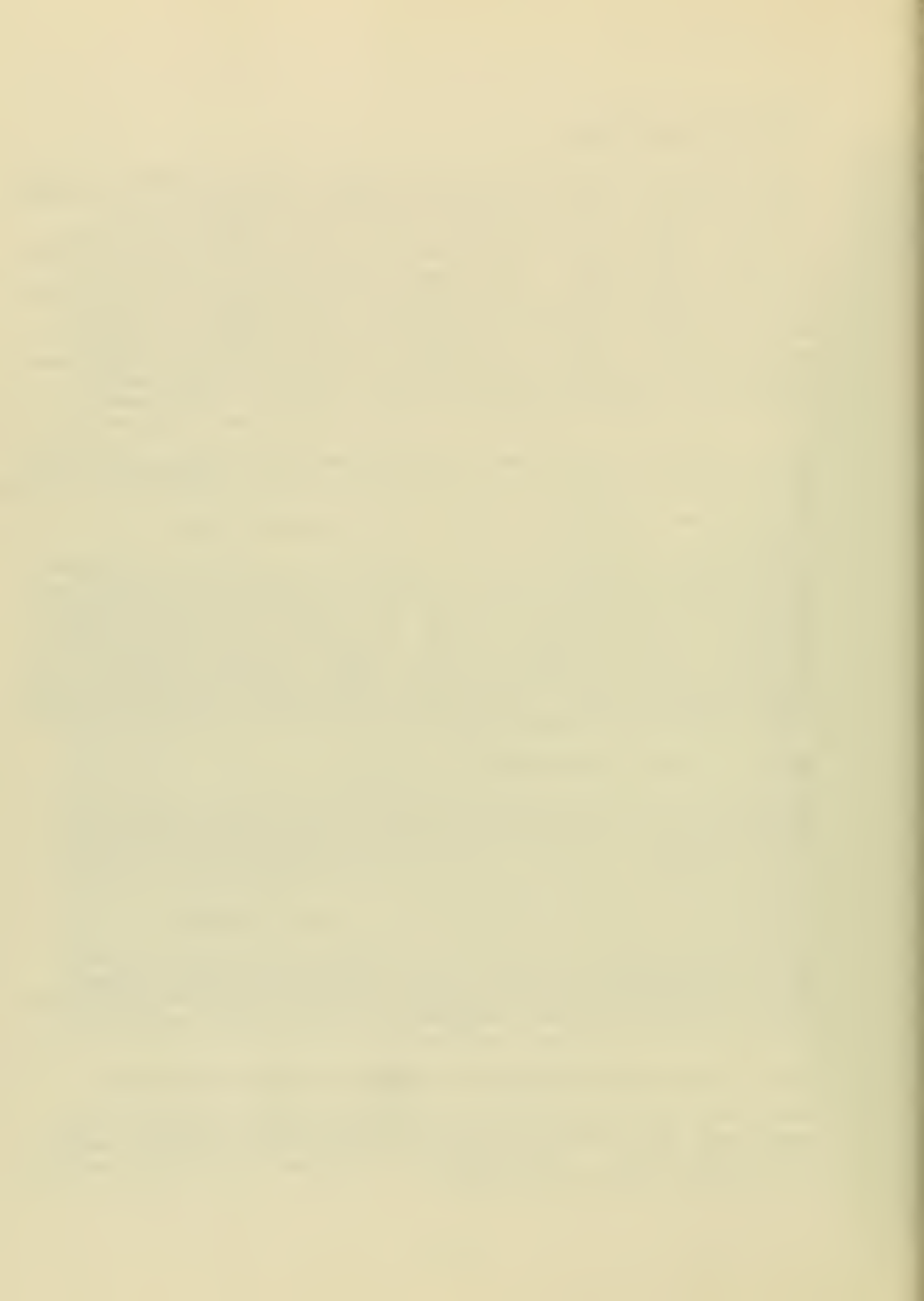
A contract was let for the construction of a steel frame structure to enclose the butterfly valves at the head of Moccasin Penstock. This structure will provide protection and security for the valves.

HH-511R - San Joaquin Pipeline No. 2, Repair Lining.

A contract was let for cleaning the interior of the pipe and applying a coal-tar lining. This work was necessary because the existing cement mortar lining, which protects the steel pipe from corrosion, has been softened by action of the soft water and the invert is being eroded away.

HH-512 - San Joaquin River Valve House, Repairs and Piping.

Under this contract, which was completed during the year, new sump pumps and related piping were installed at the San Joaquin River Valve House. Also, under this contract, a leaking manifold at the valve house was repaired.



III-514 - Moccasin Administration Building, Replace Heating System.

The plans and specifications to replace the existing oil burning steam heating system and bring the electrical service at the building up to code were completed and bids opened this year. The existing heating system had become expensive to maintain and operate because of its age and its use of fuel oil. The replacement of the oil by electric heating necessitated increasing the capacity of the building electrical system, and improving it to meet code requirements.

III-539 - Repair and Paint Concrete Trolley Poles (Van Ness Avenue).

A contract has been let to repair and paint concrete trolley poles on Van Ness Avenue. This work is part of a program to rehabilitate all trolley poles in the City.

III-543 - Repair, Reroof Hetch Hetchy Buildings, Moccasin and Early Intake.

A contract was let for the reroofing of the Machine Shop and five (5) cottages at Moccasin; reroofing Kirkwood Powerhouse at Early Intake, and replacement of parapet flashing and construction of joint flashing at Holm Powerhouse near Early Intake.

III-553 - Replace, Repair and Paint Steel Trolley Poles (Mission Street).

Contract plans and specifications have been completed to replace, repair and paint steel trolley poles on Mission Street. The contract is scheduled to start in September 1976. This work is part of a continuing program to rehabilitate all trolley poles in the City.

III-554 - Construction of #47 Trolley Coach Loop at Army Street.

At the request of the Municipal Railway, a contract was let to restore the terminal loop of the #47 trolley coach line to Army Street. Several years ago the route was shorted to turn back at 25th Street in order to facilitate the construction of the freeway interchange at Army Street and Potrero Avenue. The Department of Public Works funded the project.

III-556 - Claribel Lateral Timber Bridge.

A contract was let for the construction of a timber bridge to replace an existing wood plank bridge across the Oakdale Irrigation District's lateral that has collapsed. The bridge provides access for maintenance and inspection along our right-of-way.



The Honorable James Rolph, Jr., Mayor, and City Engineer M. M. O'Shaughnessy and party at holing through of the Foot Hill Tunnel on January 5, 1934.

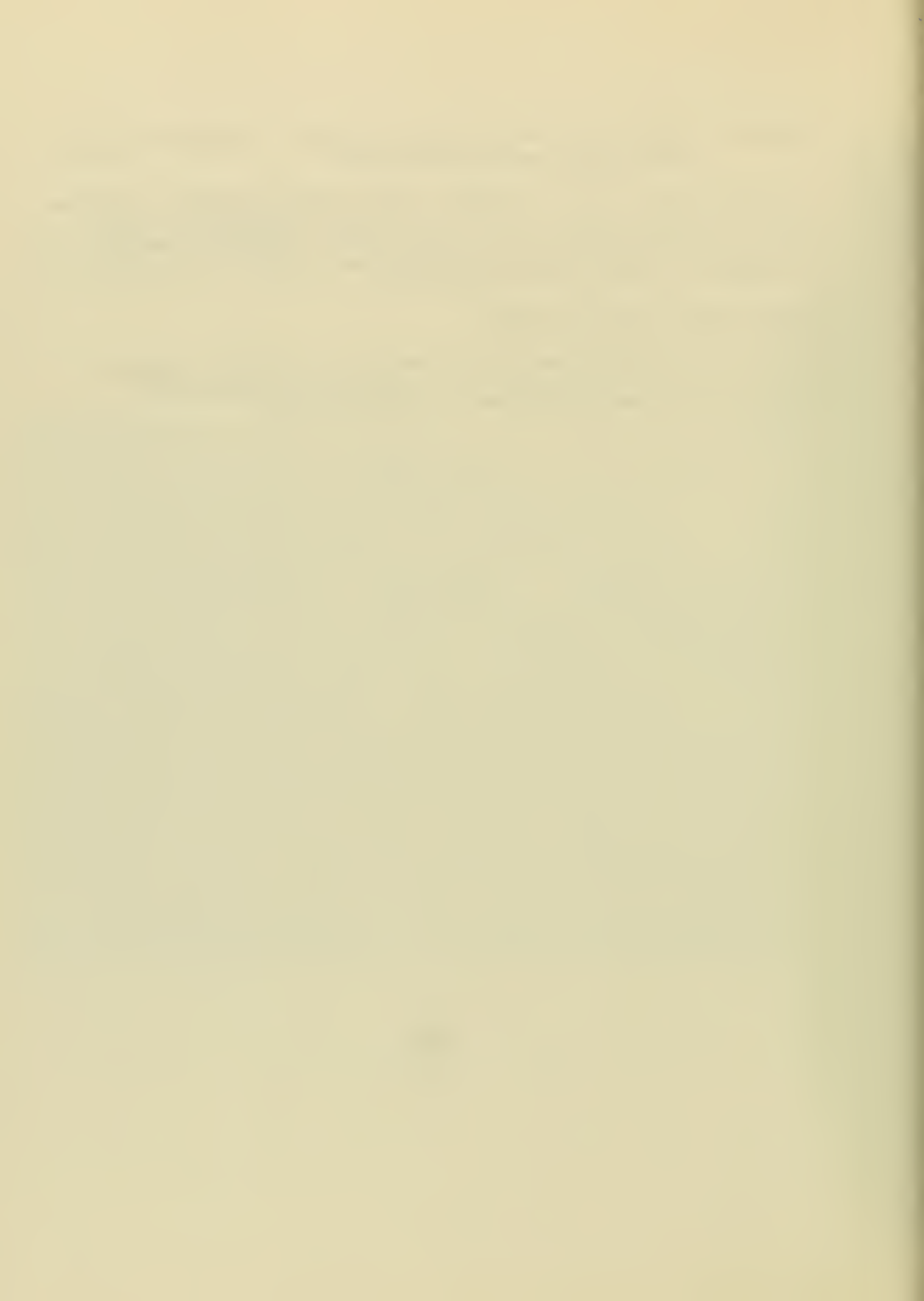


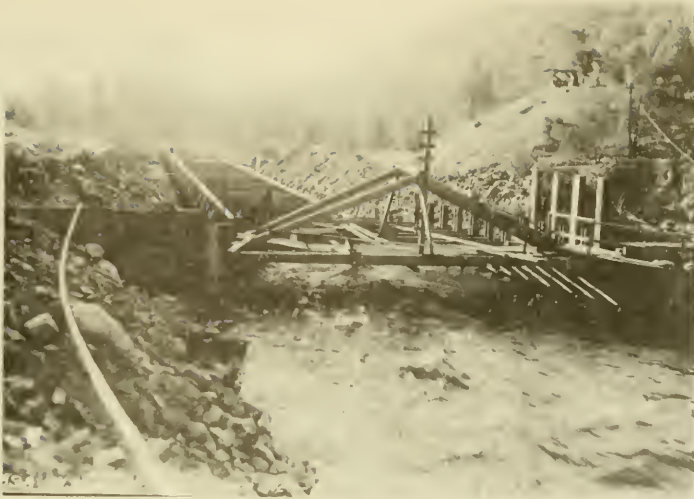
HH-564 - Moccasin and Tesla Portal Buildings - Exterior Repair,
Painting and Roof Preservative

A contract was let for exterior repair and painting of fourteen (14) cottages at Moccasin and caretaker's cottage at Tesla Portal including painting of Chlorinator, Pumphouse and Generator Buildings. This work also includes roof repair and painting of the vehicle storage shed at Moccasin.

Market Street Reconstruction

Plans and specifications for relocation of trolley wires on Market Street were prepared for inclusion in various DPW contracts for reconstruction of Market Street.





View looking downstream, showing the flume intake in the temporary cofferdam across Moccasin Creek, above the location of the downstream dam of the Moccasin Reservoir, July 14, 1927.



The completed Moccasin Spillway at the approximate site of the Diversion Flume Reconstruction completed March 18, 1976.

POWER IMPROVEMENT PROGRAM

Work during Fiscal Year 1975-76 under the UMTA-approved Federal Grant for the Power Improvement Program was as follows:

1. Grant Amendments

Based on our application submitted in February 1975, and updated in November 1975, Amendment No. 1, increasing the total Project Cost from \$29.6 to \$38.4 million and the Federal Grant from \$19.8 to \$26.8 million, was approved by UMTA on May 20, 1976. The additional funds were approved to cover increased costs due to inflation and revised Project requirements for the current fiscal year. An additional amendment to provide sufficient funds for the balance of the Project, increasing the total Project cost to \$50.5 million and the Federal Grant to \$36.5 million, is currently in the final stages of approval by UMTA and is expected in July 1976.

2. Electrification Project

A) Contracts

Construction commenced on Contract HH-521, Market Street Subway Electrification, Embarcadero Station to Duboce Portal on July 14, 1975. Bids were received on July 9, 1975 on Contract MR-622, Twin Peaks Tunnel Electrification, Structural Repairs and Improvements. Due to irregularities in the low bid and claim of the low bidder of ambiguity on the application of the San Francisco Plan, the Public Utilities Commission on July 29, 1975 voted to reject all bids and readvertise. The contract was readvertised as Contract MR-622R and bids were received on August 27, 1975. The contract was awarded on September 10, 1975 to Abbett Electric Corporation, San Francisco, California, who submitted the low bid of \$3,022,910, which includes an amount of \$1,416,422 for the Power Improvement Program portion of the contract. The contract was certified by the City Controller on October 10, 1975. Construction commenced on October 27, 1975.

Plans and specifications for Contract HH-531, Market Street Subway Electrification, Duboce Junction to Eureka Station, were approved by UMTA. Bids were received on February 26, 1976. The contract was awarded on March 9, 1976 to Amelco Electric, San Francisco, California, who submitted the low bid of \$195,428. The contract was certified by the City Controller on April 12, 1976. Construction commenced on April 26, 1976.

B) Design Services

The consultant, PBQ&D, Inc. and Gibbs & Hill, Inc. (PBGH) continued work on final design contract plans and specifications.

Contract plans and specifications for the PIP and TIP portions of Contract III-536, Streetcar Overhead System, West Portal Avenue, Conversion for Pantograph Operation, and Related Street Lighting Work were completed and will be transmitted to UMTA for approval in July. This contract is scheduled for advertising in July 1976.

Plans and specifications at the 95% completion level to be incorporated into purchase orders for special Trolley Coach Streetcar Crossing Hardware were submitted by the consultant. Review was completed and comments were transmitted to the consultant for incorporation into final documents. The special hardware will be purchased by the City, due to the 6-month manufacturing lead time, and will be furnished to several installation contractors.

Plans and specifications at the 95% completion level for the streetcar overhead system conversion for pantograph operation for Contracts III-524 ("K" Line), III-532 ("N" Line), III-533 ("J" Line), III-534 ("L" Line), and III-535 ("M" Line) were submitted by the consultant, and are being reviewed for final completion.

Plans and specifications at the 60% completion level for streetcar overhead system conversion for pantograph operation for Contract III-530 ("J" & "N" Lines, Duboce Portal) were submitted by the consultant. Review was completed and comments were transmitted to the consultant for incorporation into the 95% completion level submittal due in July 1976.

Amendment No. 1 to the existing professional services agreement, approved by the PUC on June 24, 1975, was approved by UMTA on September 5, 1975. This amendment was executed by the consultant, PBGH, on September 19, 1975 and certified by the City Controller on October 27, 1975.

C) Cable Purchase

Orders were placed with Cyprus Wire and Cable Co., South San Francisco, California for insulated copper feeder cable to be furnished as required under the \$3,151,452 purchase contract. A total of 325,000 feet of the five types of cable, having a value of \$800,000, was received

during the fiscal year and delivered to the installation contractors for the Market Street Subway and Twin Peaks Tunnel electrification contracts, and for the Downtown, Civic Center and Church Substations equipment installation contract. An additional 85,000 feet of cable was ordered but not received as yet, for other substation and feeder undergrounding contracts.

3. Substation Project

A) Contracts

Plans and specifications for Contract HH-522, Civic Center, Church and Downtown Substations, Installation of Electrical Equipment, were approved by UMTA on July 21, 1975. Bids were received on August 14, 1975. The contract was awarded on August 28, 1975 to De Narde Construction Company, who submitted the low bid of \$652,990. The contract was certified by the Controller on September 17, 1975. Construction commenced on October 6, 1975.

Plans and specifications for Contract HH-528, Laguna Honda and Judah Substations, Construct Buildings and Install Equipment, were completed and transmitted to UMTA for approval on October 28, 1975. The plans and specifications were approved by UMTA on November 11, 1975 and bids were received on December 11, 1975. The contract was awarded on January 8, 1976 to Herrero Brothers, Inc. who submitted the low bid of \$567,913. The contract was certified by the City Controller on February 5, 1976. Construction commenced on March 1, 1976. Plans and specifications for Contract HH-529, Carl Substation, Construct Building and Install Equipment, were completed and transmitted to UMTA for approval on February 25, 1976. The plans and specifications were approved by UMTA on March 9, 1976. Bids were received on April 1, 1976. The contract was awarded on April 27, 1976 to S.J. Amoroso Construction Co., Inc., Foster City, California, who submitted the low bid of \$597,800. The contract was certified by the City Controller on June 9, 1976. Construction is scheduled to start early in July, following issuance of a building permit by the Department of Public Works.

Plans and specifications for Contract HH-544, Fillmore Substation, Construct Building and Install Equipment, were completed and transmitted to UMTA for approval on May 26, 1976. The plans and specifications were approved by UMTA on June 4, 1976. The contract was advertised with bids scheduled to be received on July 15, 1976.

B) Design Services

The Consultant Bechtel, Inc. continued design work on the substation buildings and equipment installation.

Final plans and specifications for Contract III-545, Outer Mission Substation, Install Equipment, were completed by the consultant.

Final plans and specifications for Contract III-547, San Jose Substation, Install Equipment, were completed by the consultant.

Plans and specifications at the 85% completion level for Contract III-546, Randolph Substation, Construct Building and Install Equipment, were submitted by the consultant. Review was completed and comments were transmitted to the consultant for incorporation into the final documents.

Plans and specifications at the 85% completion level for Contract III-548, Taraval Substation, Construct Building and Install Equipment, were submitted by the consultant and are being reviewed for final completion.

Plans and specifications at the 85% completion level for Contract III-550, West Portal Substation, Install Equipment, were submitted by the consultant and are being reviewed for final completion.

Amendment No. 2 to the existing Professional Services Agreements, approved by the Public Utilities Commission on May 27, 1975, was approved by UMTA on July 17, 1975. This amendment was certified by the City Controller on September 10, 1975.

Amendment No. 3 to the Existing Professional Services Agreement was negotiated with the consultant. The amendment, which provides for additional services in the review of drawing submittals from the substation equipment manufacturer, I-T-E Imperial Corporation, was approved by the Public Utilities Commission on November 25, 1975, and was transmitted to UMTA for approval on November 18, 1975.

Amendment No. 4 to the existing Professional Services Agreement was negotiated with the consultant. The amendment, which provides for additional design services for Fillmore, Taraval and Bryant Substations, was approved by the Public Utilities Commission on December 9, 1975, and was transmitted to UMTA for approval on December 11, 1975.

Amendments No. 3 and 4 were approved by UMTA on February 4, 1976 and January 21, 1976, respectively, and were certified by the City Controller on February 9, 1976.

The consultant continued design work on Bryant and Richmond Substations (Contracts HH-549 and HH-551).

Building design for the relocated Taraval Substation received Phase I and Phase II approval from the San Francisco Art Commission. Final approval (Phase III) was received for three substations: Fillmore, Randolph and Taraval. This completes Art Commission approval on all six substation buildings.

C) Substation Sites

The use of either of two alternative sites for Taraval Substation was approved by City Planning on July 10, 1975 as conforming to the Master Plan. Appraisals on both sites were completed. An Offer to Sell the preferred alternate site was received from the owner. A resolution authorizing the acquisition of the property from Northern Counties Title Company was adopted by the PUC on September 10, 1975. A resolution approving acquisition of the property was adopted by the Board of Supervisors on October 6, 1975. The deed granting the property to the City and County of San Francisco was recorded on October 29, 1975.

A resolution authorizing the acquisition of an easement from the Pacific Gas and Electric Company for the Randolph Substation was adopted by the PUC on July 29, 1975. On September 2, 1975, the Board of Supervisors adopted a resolution approving the acquisition of the easement. The deed granting the easement to the City and County of San Francisco was recorded on October 3, 1975.

A resolution authorizing acquisition of property from the San Francisco Redevelopment Agency for the Fillmore Substation site was adopted by the Public Utilities Commission on April 27, 1976. On June 7, 1976, the Board of Supervisors adopted a resolution approving the acquisition of the property. The deed conveying the property to the City and County of San Francisco was executed by the San Francisco Redevelopment Agency on June 8, 1976 and was deposited in escrow on June 28, 1976. The deed will be recorded in July 1976.

With the recording of the deed for the Fillmore Substation site, all property acquisition for the six new substation buildings will be completed.

D) Equipment Purchase

The substation equipment manufacturer, I-T-E Imperial Corporation, continued production on the \$5,896,000 purchase contract.

Review of shop drawings submitted by ITE continued. Modification of Contract No. 1, covering changes to Laguna Honda Substation equipment was processed. Modification of Contract No. 2, covering changes to the gap breakers and providing for local warehousing of substation equipment was processed.

Deliveries of equipment commenced. Equipment for the Gap Breaker Stations at Eureka and Forest Hill was delivered to the Contractor, Abbett Electric, at the jobsite (Contract MR-622R) on January 27, 1976, and for the Gap Breaker Stations at Powell and Van Ness was delivered to the Contractor, Amelco Electric, at the jobsite (Contract HH-521) on February 5, 1976. Equipment for the first stage of construction at Downtown Substation was received for installation by the Contractor, De Narde Construction Co., on February 19 and 20, 1976, and equipment for Church Substation was received for installation by the Contractor, De Narde Construction Co., on March 16, 1976 and lowered through the street hatch into the substation (Contract HH-522). The equipment for Civic Center Substation was received and lowered into the station through the roof hatch opening at the U.N. Plaza on June 8, 1976. Additional equipment is being received at the local warehouse for later deliveries to installation contractors. Approximately 60% of the contract equipment is now on hand.

A Service Engineer, assigned by ITE to assist during installation and testing of the new equipment, provided assistance at the four Gap Breaker Stations and at Downtown, Civic Center and Church Substations.

Work commenced on the preparation of plans and specifications for the purchase of additional substation equipment for Stations E, F, J, and N. The recently approved amendment to the Power Improvement Program provides for the acquisition and rehabilitation of these substations, now owned by the Pacific Gas and Electric Company.

4. Control and Communication Project

The Consultant, Systems Control, Inc., had submitted the preliminary report in June 1975. Review was completed on the alternate systems designs presented in the preliminary report. The choice of design was made by Hetch Hetchy. The consultant was directed to proceed with detailed design.

The consultant delivered the Supervisory Control System specifications, at the 30% completion level, for review. In addition, the consultant submitted the design criteria for the subway maintenance telephone system for approval. Review of the submittals and design criteria was completed by Hetch Hetchy. The consultant was notified to proceed with preparation of final plans and specifications.

The 90% completion level submittal is scheduled for August 1976.

5. Feeder Undergrounding

A) United Nations Plaza (DPW Contract 23,476)

All PIP work on this contract was completed in accordance with the contract plans and specifications on September 25, 1975.

B) Judah Street (DPW Contract 23,506)

All PIP work on this contract was completed in accordance with the contract plans and specifications.

C) Ocean Avenue and Phelan Avenue Rechannalization and Track Reconstruction (DPW Contract 23,727)

Plans and specifications for the TIP and PIP portions of DPW Contract 23,727 for Ocean and Phelan Avenues Rechannalization, which will include relocation of trolley poles and the overhead trolley wire system and the undergrounding of feeder cables, along with Muni streetcar track relocation and rerailing, were approved by UMTA on April 7, 1976. The plans and specifications were approved by the State (FAU) on June 4, 1976. The contract was advertised on June 29, 1976 with bids scheduled to be received on August 4, 1976.

D) Fillmore Street, Hayes to Pine Streets, Underground Power Facilities (Contract HH-491)

All work on this contract was completed in accordance with contract plans and specifications.

- E) Ocean Avenue, Junipero Serra Boulevard to Harold Avenue
Underground Duct System (Contract HH-502)

All work on this contract was completed in accordance with contract plans and specifications.

- F) 19th Avenue, Randolph and Broad Street - Underground
Duct System (Contract HH-519)

All work on this contract was completed in accordance with contract plans and specifications on October 24, 1975.

- G) Church Street - 22nd Street to 30th Street - Underground
Duct System (Contract HH-497)

Plans and specifications for constructing manholes and underground duct banks in Church Street between 22nd Street and 30th Street were completed and transmitted to UMTA for approval on November 13, 1975. The plans and specifications were approved by UMTA on December 9, 1975. The contract was awarded on January 13, 1976 to Abbett Electric Corporation, San Francisco, California who submitted the low bid of \$109,590. The contract was certified by the City Controller on February 4, 1976. Construction commenced on February 16, 1976.

- H) Taraval Street and 46th Avenue - 20th Avenue to Vicente
Street - Underground Duct System (Contract HH-503)

Plans and specifications for constructing manholes and underground duct banks in Taraval Street and 46th Avenue between 20th Avenue and Vicente Street, were completed and transmitted to UMTA for approval on October 28, 1975. The plans and specifications were approved by UMTA on November 5, 1975. Bids were received on January 15, 1976. The contract was awarded on January 27, 1976 to Peter Kiewit Sons' Company who submitted the low bid of \$246,200. The contract was certified by the City Controller on March 9, 1976. Construction commenced on March 29, 1976.

- I) Sutter Street - Presidio Avenue to Leavenworth
Underground Duct System (Contract HH-525)

Plans and specifications for constructing manholes and underground duct banks in Sutter Street between Presidio Avenue and Leavenworth were completed and transmitted to UMTA for approval on September 4, 1975. The plans and specifications were approved by UMTA on September 16, 1975. Bids were received on November 13, 1975. The

contract was awarded on November 25, 1975 to R. Flatland Company, San Mateo, California, who submitted the low bid of \$372,835. The contract was certified by the City Controller on January 8, 1976. Construction commenced on January 26, 1976.

J) McAllister Street - Divisadero to Leavenworth
Underground Duct System (Contract HH-526)

Plans and specifications for constructing manholes and underground duct banks in McAllister Street between Divisadero and Leavenworth were completed and transmitted to UMTA on December 22, 1975. The plans and specifications were approved by UMTA on January 14, 1976. Bids were received on February 2, 1976. The contract was awarded on March 9, 1976 to R. Flatland Company, San Mateo, California who submitted the low bid of \$248,430. The contract was certified by the City Controller on May 27, 1976. Construction commenced on June 1, 1976.

K) Ashbury, Fillmore, Church, 18th and Other Streets
Underground Duct System (Contract HH-527)

Plans and specifications for constructing manholes and underground duct banks in Ashbury, Fillmore, Church, 18th and Other Streets were completed and transmitted to UMTA for approval on March 3, 1976. The plans and specifications were approved by UMTA on March 9, 1976. Bids were received on April 15, 1976. The contract was awarded on April 27, 1976 to The Lowrie Paving Company, South San Francisco, California, who submitted the low bid of \$367,998.50. The contract was certified by the City Controller on June 4, 1976. Construction commenced on June 28, 1976.

L) Ocean Avenue, Persia Avenue and Mission Street - Metro
Center to Russia Street - Underground Duct System
(Contract HH-537)

Plans and specifications for constructing manholes and underground duct banks in Ocean Avenue, Persia Avenue and Mission Street from the new Muni Metro Center to Russia Street were completed and transmitted to UMTA for approval on July 25, 1975. The plans and specifications were approved by UMTA on August 8, 1975. Bids were received on October 2, 1975. The contract was awarded on October 14, 1975 to Venturini Corporation, San Mateo, California, who submitted the low bid of \$127,267. Construction commenced on December 22, 1975. All work on this contract was completed in accordance with contract plans and specifications on June 3, 1976.

M) Judah Street - 20th to 48th Avenues - Underground Duct System (Contract HH-523)

Work remained suspended on the preparation of plans and specifications for constructing manholes and underground duct banks in Judah Street between 20th and 48th Avenues. Feeder cables will be installed in these duct banks under a later contract. The delay is due to DPW determination of the extent of the Street Improvement and Track Reconstruction work.

N) Feeder Underground - Folsom and Howard Streets (Contract HH-448)

O) Feeder Undergrounding - Sutter and McAllister Streets (Contract HH-540)

P) Feeder Undergrounding - Irving, Carl, Duboce Fillmore and Church Streets (Contract HH-552)

Work commenced on the preparation of plans and specifications for installation of feeder cables in duct banks constructed under other contracts.

Q) San Jose Avenue and Broad Street - Metro Center to Plymouth Street - Underground Duct System (Contract HH-558)

R) Folsom and Howard Streets, Main to 11th Streets Underground Duct System (Contract HH-559)

S) Haight Street - Stanyan to Gough Streets - Underground Duct System (Contract HH-560)

T) Fillmore, Jackson, Presidio and Other Streets Underground Duct System (Contract HH-561)

U) Fulton and McAllister Streets - Stanyan to Divisadero Underground Duct System (Contract HH-562)

V) Folsom Street - 11th to 16th Streets and 11th Street Market to Bryant - Underground Duct System (Contract HH-563)

W) Hayes Street - Van Ness Avenue to Stanyan Street Underground Duct System (Contract HH-567)

Work commenced on the preparation of plans and specifications for constructing manholes and underground duct banks. Feeder cables will be installed in these duct banks under later contracts.

X) Other Work

Preliminary engineering and plans and specifications are proceeding for duct lines and feeder undergrounding in accordance with the requirements of the Program.

Y) Manhole Frames and Covers (Second Contract)

Delivery of all manhole frames and covers, totalling 100 sets, was completed on September 15, 1975.

Z) Manhole Frames and Covers (Third Contract)

Contract documents for purchasing an additional 200 sets of manhole frames and covers for use on future Power Improvement Program contracts were prepared and transmitted to UMTA for approval on April 15, 1976, and were approved by UMTA on May 4, 1976. Bids are scheduled to be received by the City Purchaser on July 16, 1976.

6. Overhead Line Work

A) K-Line, Transit Power Facilities, Street Lighting and Related Work (Contract HH-517)

Plans and specifications for trolley pole replacement, overhead trolley wire reconstruction, feeder undergrounding and street lighting on Junipero Serra Boulevard from St. Francis Circle to Ocean Avenue, and for feeder cable installation in duct banks previously constructed under Contracts HH-498 and HH-502 on West Portal Avenue and on Ocean Avenue, were completed and transmitted to UMTA for approval on December 9, 1975. The plans and specifications were approved by UMTA on December 15, 1975. Bids were received on January 29, 1975. The contract was certified by the City Controller on April 17, 1976. Construction commenced on May 24, 1976.

B) K-Line, Ocean Avenue at Route 280 Overpass, Track Reconstruction and Power Facilities (Contract MR-620)

Plans and specifications for trolley overhead work and underground duct lines to be included in Contract MR-620, "K" Line, Ocean Avenue at Route 280 Overpass, Track Reconstruction and Power Facilities, were completed and transmitted to TIP on November 20, 1975. The plans and specifications were completed by TIP and transmitted to UMTA for approval on January 23, 1976. The plans and specifications were approved by UMTA on February 18, 1976. Bids were received on March 12, 1976. The low bid in the amount of \$328,820 includes an amount of

\$64,526 for the Power Improvement Program (PIP) portion of the work. The contract was awarded to Homer J. Olsen, Inc., Union City, California on April 9, 1976. The contract was certified by the City Controller on June 16, 1976. Construction work commenced on June 28, 1976.

C) Transit Preferential Street Program: Mission Street and Fourth Street, Muni Passenger Platforms and Muni Power Facilities (DPW Contract 23,834)

Plans and specifications for the PIP portion of Department of Public Works (DPW) Contract No. 23,834, Transit Preferential Street Program: Mission Street, Beale to South Van Ness Avenue; and Fourth Street, Market to Townsend; which include the relocation of trolley coach overhead facilities, were transmitted to UMTA for approval on October 14, 1975. The Department of Public Works transmitted the final contract plans and specifications were approved by UMTA on April 7, 1976 and the State (FAU) on April 29, 1976. Advertising of the contract is awaiting scheduling by the Department of Public Works.

7. Miscellaneous

- A) Coordination meetings of the joint staffs of Transit Improvement Program and the Power Improvement Program were held.
- B) Coordination meetings were held between Hetch Hetchy staff and the consultants on the electrification, substation and control and communication projects.

BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 43.5% owned by the City; 54.7% owned by the Pacific Gas and Electric Company; and a small percentage, 1.8%, jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 81.3% of the lights are City-owned. Five years ago, the corresponding figure was 74.4%.

In fiscal year 1933-34, the cost for street lighting was \$1.25 per capita; last year, with approximately thirty times as much light on the streets and public thoroughfares, the cost per capita was approximately \$1.85.

Maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Bureau. A second contract covered work required for repair of damaged and defective equipment, painting and miscellaneous maintenance.

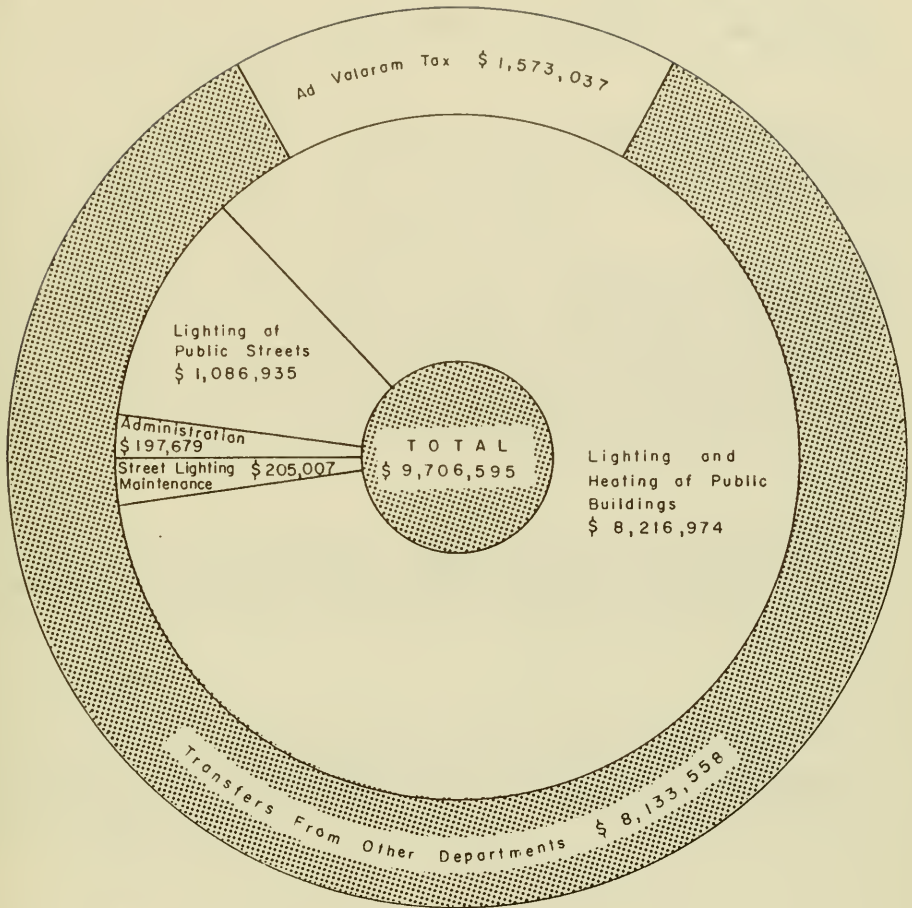
Under contract, the Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned streetlight operation was supplied by the Hetch Hetchy power system.

Engineering

The Bureau reviews, recommends changes, approvals or rejections of, and correlates all street lighting installations, including that done by the Department of Public Works, the Pacific Gas and Electric Company, the State of California, subdividers, etc.

During the fiscal year 1975-76, 19 street lighting contracts, involving a total of 819 new streetlights, were approved by the Public Utilities Commission. Plans were submitted only after careful checking to determine that illumination will exceed the minimum requirements established by the American National Standards Institute; and that all materials used, and manner of installation, meet with the applicable local, state and federal rules, regulations and statutes governing the installation of electrical works.



BUREAU OF LIGHT, HEAT & POWER

REVENUES AND EXPENDITURES

FISCAL YEAR 1975-1976

Operation and Maintenance

As of June 30, 1976, a total of 37,378 City-owned and Company-owned streetlights were in service to the public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and type of units in service at the end of the fiscal year is shown in Appendix Table.

A total of \$1,326,226 was expended for operation, maintenance, and repair of the street lighting system. Of the total cost, \$12,649 was paid by the State for its share of the operation and maintenance of street lighting at intersections on City streets, which are part of the State Highway system.

During the fiscal year, there were 114 accidents involving damage to City-owned street lighting property. Investigation was made, as soon as possible, to remove hazards to the public and obstructions to traffic. Total cost of repairs to damaged City-owned street lighting property was \$73,125. Every effort was made to secure reimbursement for damages incurred from responsible parties. Previous experience indicates that approximately three-fourths of the repair costs will be recovered.

Complaints

During the year, 48 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and requests for temporary and permanent relocation of street lighting poles.

Improvements

During the fiscal year 1975-76, a total of 868 new City-owned streetlights were placed in service at a cost of \$724,798. Improvements were financed by State Gasoline Tax and the 1964 and 1972 Street Lighting Bond Issues as indicated in Appendix Tables 16 and 17.

UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas supplied to municipal departments is furnished by the Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity and Gas

During the fiscal year, 486,936,786 kilowatthours of electrical energy were consumed through 1,054 municipal accounts at an expenditure of \$6,077,738. Of the above, 147,463,469 kilowatt-hours of energy were supplied to the San Francisco International Airport for resale to tenants. Natural gas consumption was 17,787,179 therms through 556 accounts at a cost of \$2,691,890.

There were several increases in gas rates last year which increased the cost to municipal accounts by approximately \$805,652. The average cost per therm increased by approximately 42%.

A summary of consumption and expenditures for these commodities is shown in Tables 12 and 13.

A P P E N D I X

TABLE 1

HETCH HETCHY WATER AND POWER*COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)FISCAL YEAR 1975-76

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 779,469	\$ 649,653	\$ -129,816
111	Overtime	15,750	15,400	-300
112	Holiday Pay	4,070	2,662	-1,408
120	Temporary Salaries	53,180	49,102	-4,078
130	Wages	1,789,623	1,427,802	-361,821
139	Permanent Salaries - Gardeners	58,107	53,393	-4,714
200	Contractual Services	79,090	97,226	18,136
216	Maint. and Repair of Auto Equipment	12,000	6,118	-5,882
231-1	Purchase of Power for Resale	4,284,000	3,903,720	-380,280
231-2	Service Charge for Transm. and Dist.	2,500,000	2,436,435	-63,565
251	Subsistence of Employees	10,000	3,464	-6,536
300	Materials and Supplies	140,875	157,519	16,644
640	Water Rights and Damage Claims	12,000	- 0 -	-12,000
641	Hydrography	45,800	45,713	-87
801	Accident Compensation	24,750	42,438	17,688
804	Claims	500	163	-337
812	Fidelity Insurance	72	82	10
813	Automobile Insurance	11,130	11,130	- 0 -
814	Fire Insurance	23,064	23,064	- 0 -
815	Miscellaneous Insurance	39,498	39,498	- 0 -
853	Assessments	45,000	17,077	-27,923
854	Membership Dues	5,312	5,744	432
855	Fee to U.S. Gov't. - Raker Act	30,000	30,000	- 0 -
856	Maint. of Roads - Raker Act	15,000	15,000	- 0 -
860	Retirement Allowances	550,401	367,277	-183,124
862	Social Security	114,902	119,989	5,087
865	Health Service System	58,916	33,410	-25,506
870	Taxes	525,396	525,312	-84
880	Rental - Transm. Lines and Offices	136,400	111,900	-24,500
900	Services of Other Departments	864,121	864,121	- 0 -
	TOTAL OPERATION AND MAINTENANCE	\$12,228,426	\$11,054,412	\$ -1,174,014
400	Equipment	59,634	59,628	-6
476	Library and Reference Books	800	- 0 -	-800
500	Additions and Betterments	24,000	24,000	- 0 -
700	Reconstruction and Replacement	197,000	197,000	- 0 -
830	Bond Interest and Redemption	8,840,856	8,840,856	- 0 -
	TOTALS	<u>\$21,350,716</u>	<u>\$20,175,896</u>	<u>\$ -1,174,820</u>

* Does not include Transit Power Division - Table 4 or Bureau of Light, Heat and Power - Table 11.

TABLE 2

SUMMARY OF TAXES

FISCAL YEAR 1975-76

HETCH HETCHY PROJECT

<u>Tax Levying Bodies</u>	<u>Assessed Values</u>	<u>Total Amount of Taxes</u>
Alameda County	\$ 2,350.00	\$ 284.62
San Joaquin County	42,250.00	4,533.68
San Mateo County	3,610.00	322.10
Stanislaus County	116,170.00	11,442.62
Tuolumne County	5,706,865.00	507,957.24
Banta-Carbona Irrigation Dist.	3,642.28	156.62
Oakdale Irrigation Dist.	25,897.00	544.94
West Stanislaus Irrigation Dist.	4,250.00	153.00
	<u>\$ 5,905,034.28</u>	<u>\$ 525,394.82</u>

TABLE 3

TRANSIT POWER DIVISION

MOTIVE POWER SECTION - SUBSTATIONS

Substation	Type (a)	Date Installed	No. of Units	KW Size	Fiscal Year 1975-76	
					Max. Loan in KW	KWH Converted to 600 v d-c
Bryant	M-G	1910	3	1500	2254	7,650,600
	M-G	1910	(b) 2	1500	0	0
Turk	M-G	1910	3	1500	4494	8,178,550
	M-G	1910	(b) 2	1500	0	0
Downtown	SC	1921	2	2000	3460	7,569,200
	SC	1924	1	3000		
Eighth Avenue	SC	(c) 1921	1	1500	1395	2,944,800
	SC	(c) 1921	(b) 1	1500	0	0
	SC	1924	1	2000		
West Portal	MAR	1951	1	2000	2325	5,602,000
Outer Mission	MAR	1953	1	750	860	2,565,000
Geneva	M-G	1910	3	1500	1370	17,500
						<hr/> 34,527,650

Notes: (a) Type of Conversion Equipment:

M-G = Motor-Generator

SC = Synchronous Converter

MAR = Mercury Arc Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1975-76

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110-1	Permanent Salaries	\$ 75,529	\$ 36,532	\$ -38,997
130-1	Wages	1,230,128	973,844	-256,284
200-1	Contractual Services	30,000	2,055	-27,945
300-1	Materials and Supplies	56,000	14,973	-41,027
801-1	Accident Compensation	35,250	18,571	-16,679
860-1	Retirement Allowance	247,147	160,723	-86,424
862-1	Social Security	50,723	52,508	1,785
865-1	Health Service System	10,159	14,620	4,461
900-1	Services of Other Departments	175,258	175,258	- 0 -
		<hr/>	<hr/>	<hr/>
	TOTAL OPERATION AND MAINT.	\$ 1,910,194	\$1,449,084	\$ -461,110
700	Reconstruction and Replacement	2,595,000	2,595,000	- 0 -
		<hr/>	<hr/>	<hr/>
	TOTAL	<u>\$ 4,505,194</u>	<u>\$4,044,084</u>	<u>\$ -461,110</u>

TABLE 5

HETCH HETCHY WATER AND POWER

SUMMARY OF RECEIPTS AND EXPENDITURES

FISCAL YEAR 1975-76

<u>RECEIPTS</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
Revenue from Sale of Electrical Energy	\$ 15,883,000	\$ 19,693,525	\$ 3,810,525
Revenue from Sale of Water and Standby Charge, SFWD	6,500,000	6,500,000	- 0 -
Other Revenue	<u>100,000</u>	<u>187,307</u>	<u>87,307</u>
	\$ 22,483,000	\$ 26,380,832	\$ 3,897,832
 <u>EXPENDITURES</u>			
Total Expenditures	<u>\$ 25,855,910</u>	<u>\$ 24,219,980</u>	<u>\$-1,635,930</u>

TABLE 6
HETCH HETCHY WATER SUPPLY

PRECIPITATION, RUNOFF, STORAGE AND DELIVERY
AS OF JUNE 30 BY FISCAL YEARS

<u>SEASON PRECIPITATION (INCHES)</u>	<u>Normal</u>	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74</u>	<u>1974-75</u>	<u>1975-76</u>
Hetch Hetchy	34.27	24.84	35.97	38.46	39.15	21.80
Lake Lloyd	46.92	32.77	46.03	57.45	47.86	24.91
Approx. Percent of Normal	100%	71%	102%	112%	107%	58%

WATERSHED RUNOFF (ACRE-FT.) (a)

Hetch Hetchy	726,098	584,400	780,799	871,240	769,239	376,347
Lake Lloyd)	424,759	331,800	444,358	533,923	450,131	229,041
Lake Eleanor)						
Total	<u>1,150,857</u>	<u>916,200</u>	<u>1,225,157</u>	<u>1,405,163</u>	<u>1,219,370</u>	<u>605,388</u>
Approx. Percent of Normal		79%	106%	121%	105%	52%

No Spill Capacity

<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>	<u>(b)</u>
Hetch Hetchy	360,360
Lake Lloyd	268,800
Lake Eleanor	27,100
Total	<u>656,260</u>
	<u>478,293</u>
	<u>607,624</u>
	<u>655,173</u>
	<u>594,695</u>
	<u>358,578</u>

DELIVERY TO SFWD (ACRE-FT.) (a)

Average per day	702	585	532	675	588
Maximum per day	856	856	850	925	934
Total for fiscal year	<u>257,046</u>	<u>213,684</u>	<u>193,518</u>	<u>246,514</u>	<u>215,276</u>

Total since operation of Hetch Hetchy Aqueduct began in 1934: 4,800,026 acre-feet

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
(b) Includes delivery to Livermore site, U.S. Atomic Energy Commission.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1975-76

PLANT DATA	Nameplate Rating (Kilowatts)	Capability (Kilowatts)	Annual Plant Factor - %
Nocassin Powerhouse	90,000	104,000	50.6
Dion R. Holm Powerhouse	135,000	150,000	50.0
Robert C. Kirkwood Powerhouse	67,500	85,000	70.2
Total	292,500	339,000	

ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)

<u>Gross Generation</u>			
Nocassin Powerhouse		460,560,000	
Dion R. Holm Powerhouse		657,219,000	
Robert C. Kirkwood Powerhouse		522,892,000	1,640,671,000
<u>Station Service</u>			
Nocassin Powerhouse		841,700	
Dion R. Holm Powerhouse		1,238,750	
Robert C. Kirkwood Powerhouse		772,150	2,852,600
<u>Net Generation</u>			
			1,637,818,400
<u>Supplementary Energy</u>			
"Bank" Withdrawal*		36,545,220	
Purchase (PGandE)		247,922,311	284,467,531
<u>Total</u>			
			1,922,285,931

ENERGY DISTRIBUTED (KILOWATT-HOURS)

<u>Sales</u>			
Municipal Accounts		490,203,242	
Modesto Irrigation District		865,104,000	
Turlock Irrigation District		248,817,883	
Kaiser Cement and Gypsum Corp.		78,351,659	
Kaiser Aluminum and Chemical Corp.		11,280,000	
Norris Industries, Inc.		7,167,744	
Lockheed Missiles and Space Co. Inc.		80,177,458	
General Motors Corporation		28,837,778	
I B M Corporation		25,761,600	
Liquid Air, Inc.		12,547,200	
Miscellaneous Customers		920,851	1,849,169,415
<u>Non-Revenue</u>			
Project Use		3,277,963	
"Bank" Deposit*		2,773,513	6,051,476
<u>Losses</u>			
Hetch Hetchy System		33,816,359	
PGandE System (Municipal Accounts)		33,248,681	67,065,040
<u>Total</u>			
			1,922,285,931

* In accordance with letter-agreement between City and PGandE dated 6/24/75

TABLE 8

HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1974-75 AND 1975-76
 (Nearest 100,000 Kilowatthours)

<u>CUSTOMER</u>	<u>1974-75</u>	<u>1975-76</u>
Municipal Accounts		
International Airport	189,900,000	189,200,000
Municipal Railway	64,800,000	56,900,000
Public Works	26,600,000	26,800,000
Street Lighting	45,800,000	46,400,000
Unified School District	38,300,000	39,700,000
Water Department	44,000,000	48,400,000
Other City Departments	71,900,000	82,800,000
Modesto Irrigation District	734,900,000	865,100,000
Turlock Irrigation District	219,100,000	248,800,000
Kaiser Cement and Gypsum Corp.	143,700,000	78,400,000
Kaiser Aluminum and Chemical Corp.	28,100,000	11,300,000
Norris Industries, Inc.	21,700,000	7,200,000
Lockheed Missiles & Space Co., Inc.	209,300,000	80,200,000
General Motors Corporation	76,000,000	28,800,000
I B M Corporation	82,100,000	25,800,000
Liquid Air, Inc.	28,100,000	12,500,000
Miscellaneous Customers	<u>800,000</u>	<u>900,000</u>
TOTAL	<u>2,025,100,000</u>	<u>1,849,200,000</u>

TABLE 9

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1974-75 AND 1975-76
 (Nearest \$1,000)

<u>CUSTOMER</u>	<u>1974-75</u>	<u>1975-76</u>
Municipal Accounts		
International Airport	\$ 1,588,000	\$ 2,542,000
Municipal Railway	649,000	649,000
Public Works	333,000	330,000
Street Lighting	485,000	517,000
Unified School District	567,000	553,000
Water Department	395,000	476,000
Other City Departments	912,000	1,011,000
Modesto Irrigation District	4,289,000	7,457,000
Turlock Irrigation District	1,483,000	2,283,000
Kaiser Cement and Gypsum Corp.	1,927,000	1,318,000
Kaiser Aluminum and Chemical Corp.	418,000	220,000
Norris Industries, Inc.	227,000	164,000
Lockheed Missiles & Space Co., Inc.	2,772,000	1,454,000
General Motors Corporation	1,054,000	572,000
I B M Corporation	1,122,000	478,000
Liquid Air, Inc.	373,000	190,000
Miscellaneous Customers	9,000	10,000
TOTAL	<u>\$ 18,603,000</u>	<u>\$ 20,224,000</u>

TABLE 10

HETCH HETCHY POWER SYSTEM
ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76
NET GENERATION						
Moccasin Powerhouse	531,070,800	533,978,200	542,886,200	554,418,600	539,122,000	459,718,300
Dion R. Holm Powerhouse	892,230,400	808,515,430	653,141,570	818,867,290	875,047,560	655,980,250
Robert C. Kirkwood Powerhouse	630,874,100	614,151,930	601,147,890	616,788,400	640,097,630	522,119,850
Subtotal	2,054,175,300	1,956,645,560	1,797,175,660	1,990,074,290	2,054,267,190	1,637,818,400
SUPPLEMENTAL ENERGY						
"Bank" Withdrawal*	133,964,745	46,360,466	0	36,435,281	123,458,969	36,545,220
Purchase (PG&E)	46,097,953	108,734,434	351,288,448	44,401,773	0	247,922,311
Subtotal	180,062,698	155,094,900	351,288,448	80,837,054	123,458,969	284,467,531
TOTAL	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>	<u>2,070,911,344</u>	<u>2,177,726,159</u>	<u>1,922,285,931</u>
DISTRIBUTION						
Sales						
Municipal Accounts	458,127,155	478,105,789	508,259,909	482,482,697	481,275,895	490,203,242
Yodesto Irrigation Dist.	728,371,000	796,740,000	858,816,000	787,392,000	734,880,000	865,104,000
Turlock Irrigation Dist.	321,456,000	360,619,200	421,484,000	302,784,000	219,120,000	248,817,883
Kaiser Cement & Gypsum	152,736,000	152,127,205	145,368,000	156,720,000	143,688,000	78,351,659
Kaiser Aluminum & Chemical	39,549,000	33,996,000	31,521,600	31,320,000	28,137,600	11,280,000
Norris Industries, Inc.	24,033,485	17,664,768	22,325,760	22,502,016	21,695,155	7,167,744
Hercules, Inc.	94,662,000	57,906,000	---	---	---	---
California Ammonia Co.	104,280,480	80,876,760	---	---	---	---
Air Products & Chemicals	32,653,056	---	---	---	---	---
Valley Nitrogen Producers	108,631,560	---	---	---	---	---
Lockheed Missiles	---	---	---	---	---	---
General Motors	---	---	---	39,556,800	209,304,000	80,177,458
IBM Corporation	---	---	---	---	75,978,000	28,837,778
Liquid Air, Inc.	---	---	---	---	82,047,387	25,761,600
Miscellaneous Customers	745,614	759,065	847,858	733,633	28,139,425	12,547,200
Non-Revenue					809,002	920,851
Project Use	4,101,136	4,287,512	4,003,796	3,266,691	3,264,541	3,277,963
"Bank Deposit"*	47,826,652	9,756,928	28,985,698	130,908,552	33,771,707	2,773,513
Losses						
	117,064,260	118,901,233	126,851,487	113,244,955	115,615,447	67,065,040
TOTAL	<u>2,234,237,998</u>	<u>2,111,740,460</u>	<u>2,148,464,108</u>	<u>2,070,911,344</u>	<u>2,177,726,159</u>	<u>1,922,285,931</u>

* In accordance with letter - agreement between City and PG&E dated June 24, 1975.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENSITURES AND RECEIPTS
(INCLUDING ENVUMBRANCES)

FISCAL YEAR 1975-76

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER</u> <u>+OVER</u>
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 175,980	\$ 158,116	\$ -17,864
111	Overtime	550	261	-289
112	Holiday Pay	400	261	-139
200	Contractual Services	1,250	1,259	+9
231	Lighting and Heating of Public Buildings - General	2,113,223	2,076,281	-36,942
231-1	Lighting and Heating of Public Buildings - Special Fund	6,086,322	6,140,693	+54,371
231-2	Lighting of Public Streets - Pacific Gas and Electric Co.	577,000	581,186	+4,186
231-3	Lighting of Public Streets - Hetch Hetchy	493,000	504,549	+11,549
231-4	Lighting of Public Streets - Calif. Division of Highways	1,200	1,200	-0-
300	Materials and Supplies	460	490	+30
813	Auto Insurance	257	222	-35
860	Retirement Allowance	28,732	25,761	-2,971
862	Social Security	8,190	5,792	-2,398
865	Health Service System	5,793	3,884	-1,909
954	EDP - PUC Data Processing	1,633	1,633	-0-
TOTAL		<u>\$9,493,990</u>	<u>\$9,501,588</u>	<u>\$ +7,598</u>
<u>RECEIPTS</u>				
Interfund Receipts*		\$7,641,616	\$7,928,551	\$ +286,935
Ad Valorem Taxes		<u>1,852,374</u>	<u>1,573,037</u>	<u>-279,337</u>
TOTAL		<u>\$9,493,990</u>	<u>\$9,501,588</u>	<u>\$ -7,598</u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

<u>DESCRIPTION</u>	<u>TOTAL FUNDS</u>	<u>EXPENDITURE</u>	<u>-UNDER</u> <u>+OVER</u>
Maintenance and Repair of Street Lighting Installation	\$ 205,000	\$ 205,007	\$ +7

* Transfers from other Departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER
EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1975 - 1976

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION KILOWATT-HOUR</u>	<u>EXPENDITURES</u>
Art Museum	1	1,095,360	12,696
Auditorium and Brooks Hall	1	4,539,200	54,415
Child Care Centers	12	239,694	4,908
City Demonstration Agency (a)	1	77,680	1,202
City Planning	1	81,460	1,384
De Young Museum	1	3,206,400	33,641
Disaster Corp.	1	78	1,244
Electricity	5	446,070	7,106
Farmer's Market	1	19,696	421
Fire	59	3,036,107	53,699
Hassler Health Home	1	201,000	3,000
Health	37	26,742,105	257,322
Hetch Hetchy	6	144,124	2,926
Hidden Valley Ranch	1	938,880	11,139
International Airport (b)	18	189,260,331	2,542,054
Junior College District	26	7,694,518	88,100
Juvenile Hall	3	1,414,463	15,601
Legion of Honor	1	550,800	7,019
Library	31	2,727,443	40,796
Log Cabin Ranch	13	358,219	7,111
Municipal Railway	73	56,869,769	648,924
Parking Authority	18	193,116	4,032
Police	15	871,030	14,877
Public Buildings	11	14,829,365	149,091
Public Works	106	26,468,126	324,721
Purchasing	5	481,068	6,942
Real Estate	4	253,960	4,033
Recreation and Park	202	10,305,848	163,473
Recreation and Park - Candlestick Park	3	1,993,676	53,160
Recreation and Park - Yatch Harbor	32	1,314,476	24,276
Sheriff	3	1,636,280	16,706
Social Services	5	815,248	10,924
Street Lighting Operations (.003)	1	46,383,311	504,549
Unified School District	222	31,985,522	464,706
War Memorial	1	1,377,840	17,200
Water	128	48,384,523	476,269
TOTAL MUNICIPAL DEPARTMENTS	1,050	486,936,786	6,029,667
Academy of Sciences	2	2,951,060	30,174
State of California: Street Lighting	1	(c)	12,649
Traffic Devices	1	315,396	5,248
GRAND TOTAL FROM HETCH HETCHY	1,054	490,203,242	6,077,738

Notes: (a) New Account, previously charged in Real Estate Department
(b) Including 147,463,469 KWH resold at commercial rates for \$2,197,598 to Airport tenants
(c) Included under Street Lighting Operations.

TABLE 13
BUREAU OF LIGHT, HEAT AND POWER
EXPENDITURE FOR GAS FOR MUNICIPAL PURPOSES
FISCAL YEAR 1975 - 1976

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURES</u>
Auditorium and Brooks Hall	2	661	114
Child Care Centers	11	30,763	4,702
City Demonstration Agency (a)	1	4,584	727
City Planning	1	5,265	806
De Young Museum	1	282,182	42,911
Electricity	2	48,090	7,275
Farmer's Market	1	486	81
Fire	54	582,633	87,564
Hassler Health Home	3	32,998	4,965
Health	31	5,411,853	794,270
Hetch Hetchy	2	1,947	328
International Airport	5	1,500,388	217,420
Junior College District	17	899,104	135,658
Juvenile Hall	4	444,456	66,941
Legion of Honor	1	56,329	8,545
Library	28	113,480	17,432
Municipal Railway	13	264,921	37,718
Police	11	45,807	7,017
Public Buildings	6	1,175,537	169,329
Public Works	15	264,324	44,624
Purchasing	3	52,565	7,827
Real Estate	2	8,048	1,192
Recreation and Park	106	1,300,528	196,975
Recreation and Park - Candlestick Park	1	109,643	16,485
Registrar of Voters	1	5,837	898
Sheriff	3	473,745	68,002
Single Men's Rehabilitation Center	1	37,233	5,571
Social Services	4	55,171	8,361
Unified School District	213	4,443,213	677,284
War Memorial	3	244,240	37,171
Water	10	155,472	23,697
TOTAL MUNICIPAL DEPARTMENTS	556	17,787,179	2,691,890

Note: (a) New Account, previously charged in Real Estate Department.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER
STREET LIGHTS IN SERVICE
JUNE 30, 1976

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY- OWNED</u>	<u>JOINTLY- OWNED</u>	<u>CITY- OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTION</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500 " "	245	24	73	342
4,000 " "	997	127	1,142	2,266
6,000 " "	577	441	3,034	4,052
10,000 " "	443	24	547	1,014
100-Watt Mercury Vapor	6	43	236	285
175 " "	---	---	10	10
250 " "	2	---	79	81
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	70	70
2,500 " "	10	4	58	72
4,000 " "	177	2	104	283
6,000 " "	38	5	85	128
10,000 " "	10	---	14	24
5,500 " Fluorescent	---	---	38	38
23,000 " "	38	---	4	42
100-Watt Mercury Vapor	---	---	112	112
175 " "	44	---	3,521	3,565
250 " "	37	---	1,338	1,375
400 " "	304	---	4,604	4,908
700 " "	---	---	368	368
1,000 " "	---	---	101	101
250-Watt Sodium Vapor	---	---	10	10
400 " "	---	---	658	658
<u>OVERHEAD CONNECTION</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	1	---	---	1
4,000 " "	28	---	42	70
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	2	---	---	2
4,000 " "	52	---	7	59
6,000 " "	8	---	---	8
175-Watt Mercury Vapor	14,705	---	2	14,707
250 " "	1,907	---	---	1,907
400 " "	798	---	---	798
TOTAL, JUNE 30, 1976	20,429	692	16,257	37,378
	54.7%	1.8%	43.5%	100%
TOTAL, JUNE 30, 1975	20,599	700	15,762	37,061
NET CHANGE DURING THE YEAR	-170	-8	+495	+317

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1975 - 76

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	824,140		
Jointly-owned facilities (a)	34,623		
City-owned facilities (b)	126,819	985,582	
Less deduction for energy component		404,395	581,187
Emergency service to City-owned facilities			6,600

Lease-Lite Corporation

Group lamp replacement - City-owned facilities			57,033
--	--	--	--------

Lease-Lite Corporation

Maintenance and repair - City-owned facilities			
Routine maintenance		47,308	
Repair of damage caused by accidents (c)		42,605	
Repair of damage caused by equipment failure		41,810	
Repair of damage caused by vandals		2,679	134,402

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	30,520		
Damage caused by equipment failure	10,814		
Damage caused by vandals	1,159		42,493
=			

ELECTRIC ENERGY (HETCH HETCHY)

46,383,311 KWH at \$0.02055/KWH less 45.5% discount			519,481
---	--	--	---------

TOTAL EXPENDITURE 1,341,196

LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway Routes	12,649		
Recreation and Park Department for off-street lighting	2,281		14,930

TOTAL NET EXPENDITURE 1,326,266

AVERAGE OPERATING COST

Based on number of lights in service June 30, 1976, average total cost of operation, maintenance and repair per light per year: 35.39

- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamp and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16
BUREAU OF LIGHT, HEAT AND POWER
NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1975-76

<u>Locations</u>	<u>Number of Lights</u>	<u>Type of Lights*</u>	<u>Value Value</u>
Financed by Bond Issues:			
Castle Manor Area	17	MV	\$ 40,690
Laurel Heights Area & California St.	114	MV	113,245
Market St. Reconstruction Cont. 1	111	SV	82,907
Market St. Reconstruction Cont. 2	165	SV	109,781
Market St. Reconstruction Cont. 2B	12	SV	9,125
Market St. Reconstruction Cont. 4	30	SV	21,180
	Total		\$ 376,928
Financed by State Gasoline Tax:			
Buchanan St.-Grove to Hayes Sts.	2	MV	\$ 6,160
Evans St. - Third to Jennings Sts.	43	MV	64,970
Fairfax Ave. - Newhall to Mendell Sts.	14	MV	37,485
Galvez Ave., Newhall & Mendell Sts.	16	MV	30,510
North Water Front Area	21	MV	39,235
North Water Front Various Location	2	MV	5,990
Park Merced Area	306	MV	120,465
Turk St. - Divisadero St. to Masonic Ave.	20	MV	43,055
	Total		\$ 347,870
	Grand Total		\$ <u>724,798</u>

* MV - Mercury Vapor

SV - Sodium Vapor (High Pressure)

TABLE 17
BUREAU OF LIGHT, HEAT AND POWER
HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*	Total
Prior to							
July 1, 1953	\$ 1,748,675	\$ 617,115	-	\$ 576,404	\$ 22,650	\$ 477,651	\$ 3,442,495
1953-54	142,151	22,181	-	23,495	2,274	1,239	191,340
1954-55	155,727	30,817	-	748	16,578	543	204,413
1955-56	15,704	48,620	-	2,484	19,181	1,360	87,349
1956-57	114,168	26,641	-	7,256	-	3,003	151,068
1957-58	2,501	64,942	-	18,199	4,142	-	89,784
1958-59	-	171,367	-	10,231	626	538	182,762
1959-60	-	100,126	-	35,874	10,242	4,083	150,325
1960-61	-	82,074	-	19,236	-	1,865	103,175
1961-62	-	200,113	-	116,376	24,550	7,993	349,032
1962-63	-	84,328	-	21,700	-	-	106,028
1963-64	-	340,108	-	32,556	6,000	-	378,664
1964-65	-	97,846	-	8,975	50,857	-	157,678
1965-66	-	474,673	\$ 522,899	-	-	-	304,476
1966-67	-	111,164	188,312	5,000	-	-	507,890
1967-68	-	175,949	331,941	-	-	-	1,031,201
1968-69	-	374,229	616,722	-	40,250	-	620,635
1969-70	-	359,635	261,000	-	-	-	2,040,473
1970-71	-	490,031	1,550,442	-	-	-	2,351,545
1971-72	-	541,534	1,810,011	-	-	-	451,614
1972-73	-	451,614	-	-	-	-	503,078
1973-74	-	266,764	236,314	-	-	-	420,433
1974-75	-	297,318	123,115	-	-	-	724,798
1975-76	-	347,870	376,928	-	-	-	\$15,511,828
Totals	\$ 2,178,926	\$ 5,741,059	\$ 6,017,684	\$ 878,534	\$ 197,350	\$ 498,275	
Less: Cost of portions removed prior to fiscal year 1974-75						\$ 1,721,122	
Cost of portions removed during fiscal year 1975-76						198,302	
Original cost of City-owned facilities in service on June 30, 1976							\$13,592,404

* Includes WPA and PWA (1935-1942). Boulevard Construction (1932-1934) Municipal Railway, Recreation and Park Department and Housing Authority.

TABLE 13

HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS

FISCAL YEAR 1975-76

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
HH-443	Moccasin Dam Spillway, Construct Weir and Energy Dissipator and Red Mountain Bar Wasteway Training Wall	Hensel Phelps Construction Co.	9-2-75	3-18-76	287,500	310,708
HH-491	Fillmore Street, Pine to Hayes Underground Power Facilities	Abbett Electric Corporation	1-28-75	9-9-75	737,618*	155,519
HH-494	Replace, Repair and Paint Trolley Poles	Mahoney Electric Co., Inc.	1-6-76	-	185,246	175,841
HH-497	Church Street, 30th to 22nd Underground Duct System	Abbett Electric Corporation	4-19-76	7-12-76	109,590**	87,296
HH-502	Ocean Avenue, Junipero Serra Boulevard to Harold Avenue Underground Duct System	Amelco Electric	3-24-75	8-13-75	196,148*	566,698
HH-503	Taraval Street, and 46th Avenue, 20th Avenue to Vicente Street Underground Duct System	Peter Kiewit Sons' Co.	4-20-76	-	246,200**	111,297
HH-507	Cherry Road, Resurface, Mile Post 16.1 to Mile Post 23.4	George Reed, Inc.	9-29-75	10-2-75	40,729	37,542
HH-510R	Sandblast and Paint Spillway Drum Gates and Operating Cylinders and Piping for Slide Gates, O'Shaughnessy Dam	Ross F. Porter - Quality Painting	9-2-75	12-23-75	49,700	49,700

TABLE 18 (Cont'd)

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
HH-511R	San Joaquin Pipeline No. 2 Repair Lining	Granite Construction Co.	2-9-76	-	700,000	245,547
HH-512	San Joaquin River Valve House Repair and Piping	Vetter Plumbing Co., Inc.	8-27-75	5-26-76	7,229	7,229
HH-513	Holm Powerhouse Penstock Painting	M.B. Painting, Inc.	5-1-75	9-23-75	33,400	31,592
HH-515	Mocasin Shop and Warehouses Replace Windows	Seasonal Glass Products	8-3-75	9-18-75	4,877	4,877
HH-518	Tesla Portal, Overflow Shaft Extension	Dalzell Corporation	6-24-75	11-3-75	25,400	27,300
HH-519	19th Avenue, Randolph and Broad Streets, Underground Duct System	Venturini Corporation	5-14-75	10-24-75	179,780*	160,988
HH-521	Market Street Subway Electrification, Embarcadero Station to Duboce Portal	Amelco Electric	8-6-75	-	1,077,000	1,056,006
HH-522	Civic Center, Church and Downtown Substation, Installation of Electrical Equipment	De Narde Construction Co.	10-6-75	-	652,990	383,488
HH-525	Sutter Street, Presidio Avenue to Leavenworth Street Underground Duct System	R. Flatland Co.	2-2-76	-	372,835*	331,650
HH-526	McAllister Street, Divisadero Street to Leavenworth Street, Underground Duct System	R. Flatland Co.	6-2-76	-	248,430**	33,340

TABLE 13 (Cont'd)

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
HH-528	Laguna Honda and Judah Substations, Construct Buildings and Install Equipment	Herrero Brothers, Inc.	3-29-76	-	567,913	288,099
HH-531	Market Street Subway Electrification Duboce Junction to Eureka Station	Amelco Electric	5-4-76	-	195,428	32,771
HH-537	Ocean Avenue, Persia Avenue and Mission Street, Metro Center to Russia Street, Underground Duct System	Venturini Corporation	1-8-76	6-3-76	127,267*	119,034
HH-538	Sutter Street, Taylor Street to Presidio Avenue, Paint Trolley and Street Lighting Poles	Simon Painting Company	12-4-75	3-2-76	7,769	7,769
HH-541	Paint Steel Towers, Moccasin - Newark Transmission Line	Frank Brown Painting Contractor	6-21-76	-	56,260	5,738
Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year						\$3,720,629

* Includes City Furnished Manhole Frames and Covers @ \$272.00 per set

**Includes City Furnished Manhole Frames and Covers @ \$342.00 per set

1976 ANNUAL REPORT 1977

HETCH HETCHY WATER AND POWER



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A N N U A L R E P O R T
FISCAL YEAR 1976-77

HETCH HETCHY WATER AND POWER SYSTEM
AND
BUREAU OF LIGHT, HEAT AND POWER

O. L. MOORE
GENERAL MANAGER

CITY AND COUNTY OF SAN FRANCISCO

GEORGE R. MOSCONE - MAYOR

PUBLIC UTILITIES COMMISSION

JOHN F. HENNING, Jr.	President
LYDIA LARSEN	Vice President
H. WELTON FLYNN	Commissioner
JOSEPH P. BYRNE	Commissioner
PETER McCREA	Commissioner
JOHN B. WENTZ	General Manager

ANNUAL REPORT
FISCAL YEAR 1976-77

HETCH HETCHY WATER AND POWER DEPARTMENT

ORAL L. MOORE - General Manager

This report is respectfully dedicated to Hetch Hetchy employees, past and present, whose devoted and conscientious efforts have made possible these accomplishments for San Francisco.



O'SHAUGHNESSY DAM AND HETCH HETCHY RESERVOIR
showing the effects of the drought in February, 1977.

HIGHLIGHTS

From the parched Redwood forests of the north state to the blazing deserts of the south, the one single aspect that dominated all of the water and power systems in California during the fiscal year is an unprecedented drought and its devastating impact. For the Hetch Hetchy Water and Power System, whose hydroelectric generation is totally dependent on water, and whose viability as a going concern is principally dependent on power revenue, the year has been a particularly difficult one financially.

The drought had its beginning in the winter of 1975-76 when lack of precipitation and meager snowmelt resulted in only 605,388 acre-feet of runoff into Hetch Hetchy Reservoirs during the spring of 1976, or 53 percent of normal. The second dry year, 1976-77, resulted in even less runoff during the past spring, totaling only 333,504 acre-feet, or 29 percent of normal. These record low inflows in successive years have left the three reservoirs in our mountain watersheds at less than 45 percent of capacity at the end of the report year.

Anticipating that the drought might continue into a second year, the Lower Cherry Aqueduct was reconditioned in the fall of 1976 in the event that water supply to the Hetch Hetchy Aqueduct would need to be supplemented with water from Cherry Reservoir. This turned out to be a farsighted move when drought conditions dictated shutting down Dion R. Holm Powerhouse and diverting this water into the aqueduct to the Bay Area in October 1976.

To further conserve water in our reservoirs against future public need, a request was submitted to the Secretary of the Interior, in March 1977, for permission to reduce fish releases from O'Shaughnessy Dam. So far, the Secretary has not advised us of any decision in the matter.

Based on the precipitation record for the water year commencing October 1, 1976, and the result of snow surveys conducted on our mountain watersheds, the San Francisco Public Utilities Commission instituted a mandatory 25 percent reduction in system water consumption. The reduction was put into effect May 1, 1977, in order to insure the ability of the Hetch Hetchy systems to meet the needs of the San Francisco Water Department and its service area during the continuing drought.

Comparing the amount of electric energy generated this year against that of previous years, the adverse impact of the drought is apparent. As generation was reduced to about 35 percent of normal, the resulting revenue available for supplying the cash flow for operating and maintaining the department was also reduced in roughly the same proportion. This necessitated rescinding many of the capital improvement projects scheduled for the year.

In spite of the above, work progressed on the federally assisted Power Improvement Program for the rehabilitation of the Municipal Railway transit power system. As of the end of the fiscal year, approximately \$26.5 million has been expended or encumbered. The professional services contracts for engineering design are 90 percent completed. Twenty-seven contracts for construction work and material purchases have been completed and twenty-two are currently in progress. Electrification of the Market Street Subway and Twin Peaks Tunnel is nearly completed. Ten of the eighteen substations are under construction, with three completed and in service. Thirty miles of the eventual fifty miles of underground duct lines are completed or under construction. Approximately 35 percent of the underground feeder cable has been installed, and an additional 20 percent is on order for delivery to current installation contractors. The conversion of the streetcar overhead trolley system for pantograph operation is progressing with all work on the "K" Line under construction; the "N" Line ready for bid; and the "J", "L" and "M" Lines in the final design stages.

HETCH HETCHY ORGANIZATION AND FUNCTIONS

Under policies established by the San Francisco Public Utilities Commission, the HETCH HETCHY WATER AND POWER DEPARTMENT and the BUREAU OF LIGHT, HEAT AND POWER serve the City and County of San Francisco in the dual function of operating department and service bureau.

Hetch Hetchy is a municipally-owned system of storage reservoirs and aqueducts which collects water from the Tuolumne River watershed and delivers it to the San Francisco Water Department. As a by-product of falling water, Hetch Hetchy operates and maintains hydroelectric generating stations and high voltage transmission lines for the production and distribution of electric energy.

Through its Transit Power Division, Hetch Hetchy has funded, operated, maintained and provided improvements for the electric facilities of the San Francisco Municipal Railway since July 1, 1969.

In order to handle this additional responsibility, Hetch Hetchy assumed control of the equipment and personnel of the Overhead Lines and Motive Power Sections of the Municipal Railway.

All of Hetch Hetchy's expenses, including those of the Transit Power Division, are supported by water and power revenues.

The Bureau of Light, Heat and Power administers contracts for furnishing electric, gas and steam services to municipal departments and handles monthly billings. It also administers contracts for furnishing street lighting services and for operation and maintenance of City-owned street lighting. Financing, design and construction of City-owned street lighting improvements are under the jurisdiction of the Department of Public Works, and plans for these improvements must be approved by the Public Utilities Commission through this Bureau. The Bureau is financed by appropriations from municipal departments and gas tax funds.

For fiscal year 1976-77, the Department administered budgeted funds for all purposes as follows:

<u>Budget</u>	<u>Number of Employees</u>	<u>Total Amount Appropriated</u>
Hetch Hetchy Water and Power	216	\$ 52,999,096
Hetch Hetchy Water and Power (Transit Power Division)	52	3,671,863
Bureau of Light, Heat and Power	<u>11</u>	<u>11,262,850</u>
	279	\$ 67,933,809



MOCCASIN POWERHOUSE AND RESERVOIR

HETCH HETCHY WATER AND POWER SYSTEM

REVENUE AND EXPENDITURES

Revenue from Hetch Hetchy Water and Power operations is derived principally from two sources:

1. Sale of water to the San Francisco Water Department
2. Sale of electric power and energy to San Francisco Municipal departments, Modesto and Turlock Irrigation Districts in the San Joaquin Valley, and seven industrial customers:

Kaiser Cement & Gypsum Corporation	Santa Clara County
Kaiser Aluminum & Chemical Corporation	Santa Clara County
Lockheed Missiles and Space Company, Inc.	Santa Clara County
General Motors Corporation	Alameda County
IBM Corporation	Santa Clara County
Liquid Air, Inc.	Alameda County
Norris Industries, Riverbank	Stanislaus County

WATER SALES

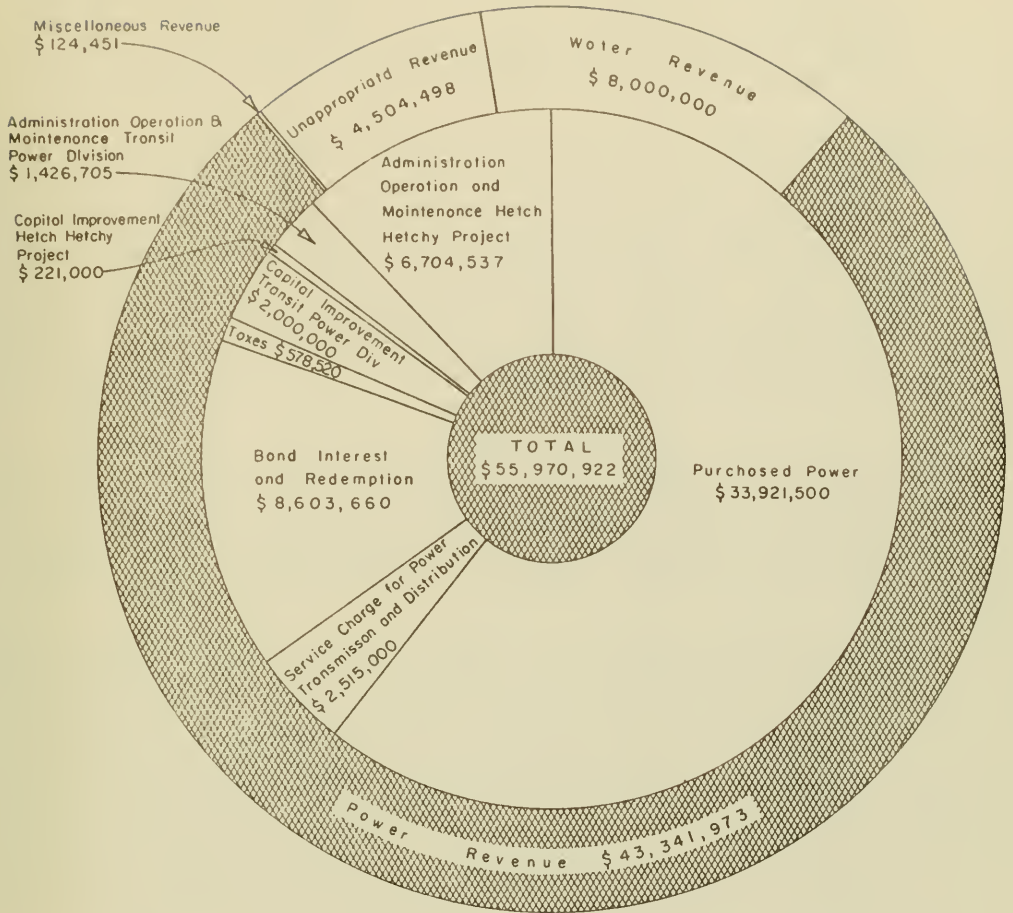
This past year, revenue from the sale of water and standby service to the San Francisco Water Department was \$8 million.

POWER SALES

Gross sale of electric energy was \$43,341,973, up from \$19,693,525 during 1975-76. This doubling of revenue is deceiving, since the increase does not represent extra return on project investments for the following reasons:

1. The increase is principally due to the record-breaking amount of supplementary power and energy which City had to purchase for resale, on account of the drought, and which was resold to the customers at substantially the same high price at which it was purchased.
2. The offset to this year's so-called record revenue, in terms of expenditure for supplementary power and energy, is \$33,921,500 instead of the \$2,100,000 budgeted, leaving only \$9,420,473 in net revenue from gross, a far cry from the record net of over \$18 million for 1974-75.

Power and energy delivered to City Departments increased 2.0 percent over the previous year, about the same rate as in 1975-76. The City department mainly responsible for this increase is the San Francisco International Airport. Consumption at the Airport, the single largest energy consumer among the City Departments,



HETCH HETCHY REVENUES
AND EXPENDITURES
FISCAL YEAR 1976-77

has increased by 3.2 percent, indicative of a resurgence of construction and expansion activities. Requirements for the Municipal Railway appear to have increased by 9.5 percent over the previous year. This is not a valid comparison, of course, because of last year's low consumption due to shutdown of the public transportation system during the 38-day employees' strike.

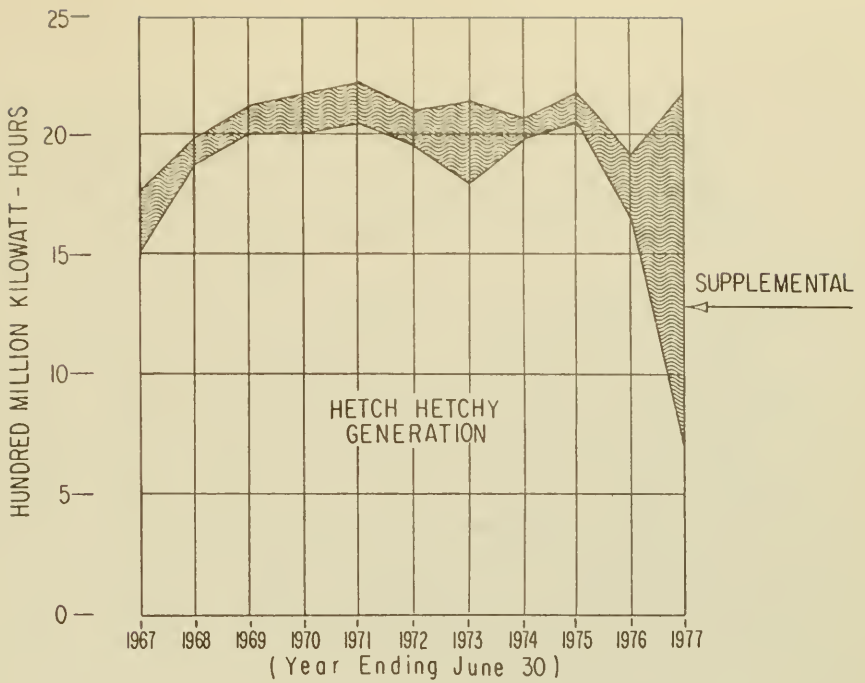
Power and energy delivered to Modesto Irrigation District, Hetch Hetchy's largest power customer, and to Turlock Irrigation District, the third largest, increased by 17.2 percent and 37.9 percent respectively this year. These increases are directly related to the drought. The storage in Don Pedro Reservoir, upon which the two Districts are dependent for generation and irrigation needs, has been going down steadily and the Districts have been extremely careful in using this precious and meager resource. Since Hetch Hetchy is in the same predicament, 86 percent of the power delivered to the Districts by Hetch Hetchy had to be supplied from supplementary power and energy purchased from the Pacific Gas and Electric Company.

Total generation of 710,002,000 kilowatthours for the report year from the project's three plants (the lowest production since 1969) amounts to 43 percent of the output of 1,640,471,000 kilowatthours in 1975-76. The financial strength of the Department resulting from this decline in electric energy generation has been severely impaired. If current conditions continue, additional shortfall in operating revenue in the upcoming fiscal year can be anticipated.

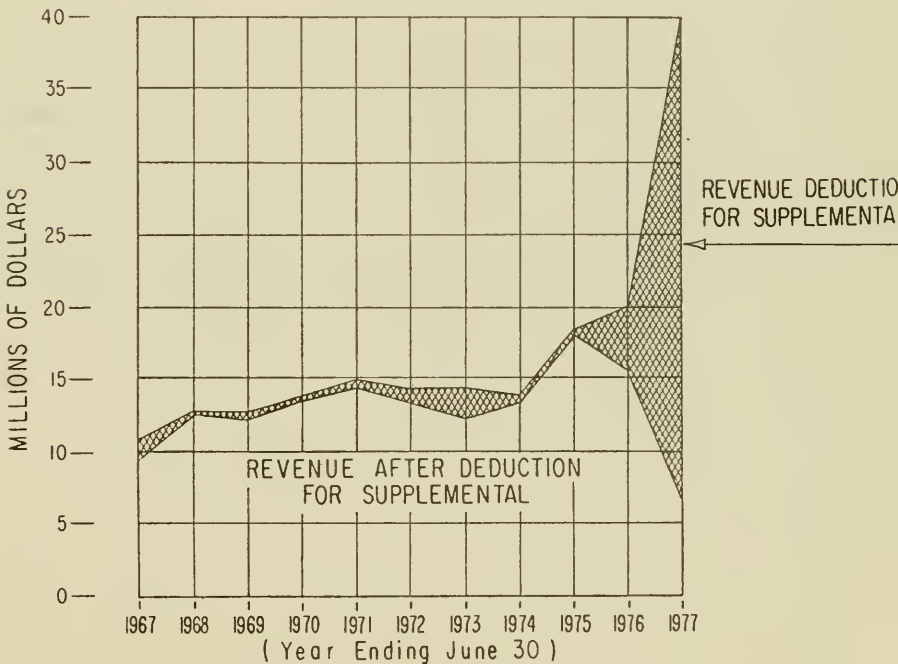
Hetch Hetchy power is sold at cost to City Departments for municipal purposes, representing a saving to taxpayers for 1976-77 of approximately \$4 million, compared to the cost if supplied by the local investor-owned utility at rates which include a "fuel cost adjustment" to account for the additional costs brought on by the unending price increases in oil, gas and coal fuel used for electric generation. Beginning September 1976, revised rates for Hetch Hetchy power, approved by the Commission on July 13, 1976, became effective for private consumers and municipal users. The higher rates boosted power revenue from these sources by nearly \$1 million in the fiscal year. This is just another step in our continuing effort to base our power rates on the value of power in the market place, in order to maximize the return of the power that is produced from the Hetch Hetchy system. In a fiscal year where generation is at a record low, this increase helped to somewhat ease the economic dislocation brought on by the reduced generation.

SYSTEM PLANNING

As part of our efforts to increase rainfall in our mountain watersheds, in light of the lessons learned from the drought, the



HETCH HETCHY ELECTRIC ENERGY SOURCES



REVENUE FROM SALE OF ELECTRIC ENERGY

Department has been investigating the feasibility of a weather modification program. The goal is to increase precipitation by cloud seeding of appropriate storms in the area. Preliminary data indicate that our effort should be directed to the Cherry Watershed. As an initial step to bring this program to fruition, plans are under way to hire expert consultants for the preparation of an Environmental Impact Report.

On October 22, 1976, the City and County of San Francisco, through the Public Utilities Commission, together with the Modesto and Turlock Irrigation Districts, submitted an "Amended Application for Preliminary Permit, Clavey-Wards Ferry Project" to the Federal Power Commission. The application was made in order that the City and the Irrigation Districts might secure and maintain priority for a license under the Federal Power Act. The proposed project consists of three small dams and related facilities designed to harness the unused power potential of the Tuolumne. They would be situated on the upper reaches of the river below the City's Dion R. Holm and Robert C. Kirkwood Powerhouses and upstream from Don Pedro Dam. It is estimated that the project has a capability of generating 400 megawatts of power as well as a new water supply of 11,900 acre-feet. However, actual development will depend on the outcome of a study by federal agencies for possible inclusion of this portion of the river in the federal wild and scenic river system.

OPERATION AND MAINTENANCE

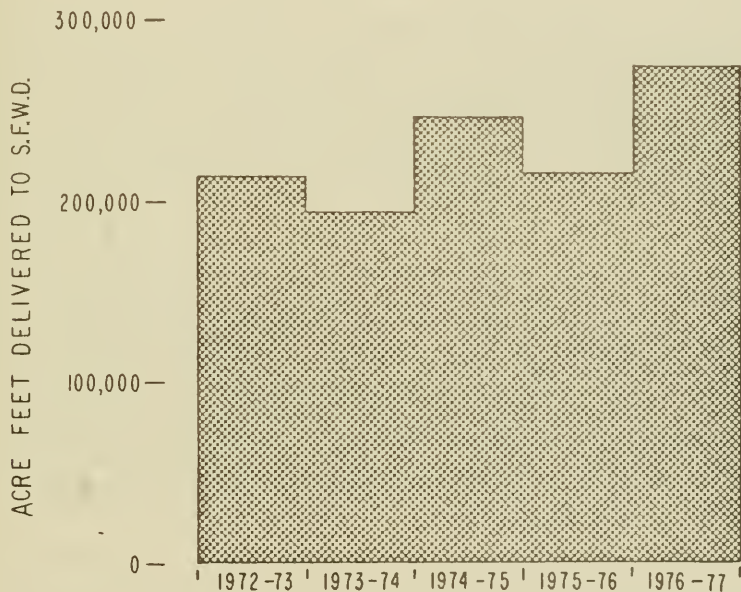
On Sunday, November 7, 1976, at approximately 0822 hours, the 13,800 volt metal-clad switchgear unit through which power is supplied to the 2,500 kVA Ridge Line transformer from Generator No. 2 at Dion R. Holm Powerhouse failed during routine testing of a protective device. The failure resulted in destruction of the circuit breaker element and related appurtenances. However, service to the Ridge Line was promptly restored by connecting it to the Mather Line, which is supplied from Robert C. Kirkwood Powerhouse. Necessary replacements were purchased from General Electric and installed by Department personnel with final adjustment and testing performed by field engineers from General Electric. All work was completed and service to the Ridge Line reverted to Dion R. Holm Powerhouse on June 3, 1977.

WATER PRODUCTION AND TRANSMISSION

Precipitation recorded for the year at our measuring stations was 52 percent of the long term average. Much of this amount fell during the normally dry summer months and did not run off.

During the year, 89,103,588,000 gallons of water were diverted from the Tuolumne River watershed through the Hetch Hetchy Aqueduct to the San Francisco Water Department, representing 105 percent of the City's total customer consumption. The water deliveries represent a decision by the Water Department to increase its local storage reserve. In addition, 223,307,920 gallons, down 6 percent from last year, were delivered to the United States Atomic Energy Commission at Mocho Shaft of the City's Coast Range Tunnel for use at the Lawrence Radiation Laboratory at Livermore; 58,864,608 gallons, up 19 percent over 1975-76, were delivered to Groveland Community Service District in Tuolumne County from the Mountain Tunnel.

Appendix Table 6 shows comparative data on precipitation, runoff, storage and delivery of the Hetch Hetchy Water Supply System.



DELIVERIES OF WATER TO
SAN FRANCISCO WATER DEPARTMENT

OPERATION AND MAINTENANCE - TRANSIT POWER DIVISION

The Transit Power Division is responsible for supplying the 600 volt direct current power that is necessary to operate the street-cars and trolley coaches of the San Francisco Municipal Railway.

The Transit Power Division is composed of two sections - the Motive Power Section and the Overhead Lines Section.

Motive Power Section

The Motive Power Section operates and maintains ten substations which convert electric power from 12,000 volts alternating current to 600 volts direct current by means of motor-generators, synchronous converters, mercury arc rectifiers and silicon rectifiers. (See Appendix Table 3 for statistical data.) Motive Power is also responsible for maintaining the electric motors and associated control equipment for operating the cable-winding machinery located in the Cable Car Powerhouse at Washington and Mason Streets. In addition, Motive Power periodically inspects, cleans, adjusts and repairs the streetcar and trolley coach headway recorders at Central Control of the Municipal Railway. The substations operate 24 hours per day, 365 days per year.

In anticipation of the need to assume responsibility for eighteen new substations being built by the Power Improvement Program (reported elsewhere in this report), this section perused and commented on the wiring and control schemes proposed for these stations. The first of the new electrical substations, Civic Center Station, was placed in revenue service in December of 1976. A commissioning ceremony was held by Mayor George Moscone who dedicated this first station to the service of the citizens of San Francisco.

A new mimic board showing the new stations in schematic form was constructed and installed at the Bryant Substation. As each new automatic station is completed and becomes operational, it will be monitored and controlled from this remote location via telephone lines. Since Civic Center, Church, Judah, Outer Mission and West Portal Stations are presently unmanned, controls for these stations were designed and installed on this new mimic board. This new status display and control board will continually be augmented with additional automatic station controls until such time as it shall be superseded by a more sophisticated and flexible Supervisory Control System.

Overhead Lines Section

The primary function of the Overhead Lines Section is to maintain in satisfactory operating condition the trolley wire overhead facilities and the electric distribution system which conveys power to it. This electric distribution system consists of both overhead lines and underground cables.

Secondary functions include the maintenance of the Municipal Railway Signal Systems and the electric light and power installations at all Municipal Railway buildings.

During fiscal year 1976-77, the Overhead Lines Section responded to 3,943 emergency calls, an increase of 8 percent over the prior year. In addition to emergency calls, this section performed a regular and extensive ongoing maintenance program. All overhead and underground facilities were systematically inspected and all worn or damaged parts that could cause accidents or equipment malfunctions were replaced. This section also operates an emergency crew 24 hours a day year round, including all holidays. The main work crew normally worked on the day shift but occasionally was assigned to night work to overhaul facilities during the hours Muni trolleys and streetcars do not run.

A considerable amount of damage to overhead facilities was caused by trolley coaches de-wiring and snagging their poles in the overhead facilities and tearing them down, or by breaking the spans with the flaying poles. Such damage was repaired at no cost to the Municipal Railway. Other parties who damaged our facilities were billed for the cost of repairs. This included damage to overhead facilities caused by high loads on trucks or careless operation of crane equipment and damage to underground feeder cables by contractors digging into our duct lines. During 1976-77, responsible parties were billed for 9 damage cases totaling \$17,246.41. The Overhead Lines Section also performed work for 4 building owners and contractors under work orders amounting to \$2,994.82. This work included moving trolley poles to accommodate driveways; relocating trolley poles and feeders to permit construction of new buildings; temporarily removing trolley wires and feeders to permit passage of high loads; and shifting of trolley wires and feeders for various excavations.

The Overhead Lines Section engaged in many other activities of a related nature which it is especially equipped to perform. These additional duties included repairs, maintenance and construction of electrical systems in Muni's car barns, offices and shops; welding and rebuilding of worn overhead lines special work; making and rebuilding parts for switches, warning block signals, car recorders, and strand alarms for the cable car system; installing mobile radio equipment; installing streetcar and bus stop signs and public information signs.

ENGINEERING DIVISION

The Engineering Division of Hetch Hetchy Water and Power provides engineering services for the Hetch Hetchy Project, Transit Power Division and the Power Improvement Program. These services include the preparation of studies, reports, cost estimates, and plans and specifications for new construction, for replacement of structures and for items of major maintenance. Surveying, inspection of construction, contract administration and payment recommendations are provided for all construction work under Hetch Hetchy Water and Power. Work of unusual magnitude or which requires special knowledge and expertise is done by engineering consulting firms which have the necessary manpower and qualifications. The Engineering Division is organized into six main sections: Civil and Construction, Electrical, Mechanical, Architectural, Engineering Administration, and Special Projects (Power Improvement Program).

During the year, plans and specifications were prepared for the following work to facilitate and maintain Hetch Hetchy operations:

HH-454 - Moccasin Sewage Treatment Plant

A package sewage treatment plant has been planned to replace the existing septic tank system. This process is a carryover from last year due to the lengthy process required to obtain approval for a federal "Clean Water Grant". State and federal permission to begin preparation of final plans and specifications was given in September, 1976. Approval of the final plans and specifications was obtained in March, 1977. The construction contract has subsequently been awarded with work to begin in August, 1977.

DAVID SHAW, STATIONARY ENGINEER,
PERFORMING A TEST AT THE MOCCASIN
SEWAGE TREATMENT PLANT



HH-514 - Moccasin Administration Building, Replace Heating System

Under this contract, completed during the year, the old heating system, using costly fuel oil, was replaced by a new electrical heating/ventilating system. In addition, extensive electrical improvements were made to bring the existing electrical system up to code requirements, and extensive plumbing and architectural improvements were also made.

HH-549 - Bryant Substation and Power Control Center

The Power Control Center (part of the Power Improvement Program described elsewhere in this report) was originally to be installed in the existing Bryant Substation building. When engineering investigations of this 1904 building revealed that it did not meet seismic standards, it was determined to construct a new building to house both the Control Center and the new substation. The Control Center portion of the building will accommodate the facilities for remote supervisory control of the eighteen new automatic substations that will provide electric power for the Municipal Railway. The design of the substation portion of the building was performed by our consultants under the Power Improvement Program. The design of the Power Control Center portion of the building has nearly been completed by Hetch Hetchy personnel. The design of the facility has received approval of the Art Commission and a City Planning Commission Environmental Impact Report determination of no significant effect on the environment.

HH-555 - Red Mountain Bar Surge Shaft Cover

A construction contract was let to cover the surge shaft with a steel frame and steel sheets to provide a barrier against debris entering the water supply.

HH-557 - Paint Steel Trolley Poles, Various Locations

A construction contract was let to prepare and paint trolley poles in numerous locations throughout the City. This work is part of a continuing program to rehabilitate all of the trolley poles in the City that are not to be replaced under the Power Improvement Program or other federal grant.

HH-565 - Lower Cherry Aqueduct Rehabilitation

In anticipation of a continued drought, an emergency construction contract was let to rehabilitate the Lower Cherry Aqueduct in order to supplement the water supply to Hetch Hetchy Aqueduct with water from Lake Lloyd and Lake Eleanor. This three mile long aqueduct was originally constructed in 1917, had not been used since 1960, and was in poor condition. The contract has been completed and diversion of water began in November 1976 with a capability of supplying approximately 130 mgd into the Hetch Hetchy Aqueduct at Early Intake.

HH-566 - San Joaquin Valve House - Backflow Prevention and Replacement of Miscellaneous Pipeline Appurtenances

Design of this facility has been directed toward a determination of the actual water level in Elliott Cut and how it is controlled.

HH-568 - Moccasin New Vehicle Refueling Station

Plans and specifications have been completed to replace and relocate the existing vehicle refueling station that does not meet present operating and safety requirements. The new location will also provide for the new air pollution control regulations.

HH-573 - Replace, Repair and Paint Trolley Poles, Various Locations

A contract was let to replace, repair and paint trolley poles at various locations. This work is part of a continuing program to rehabilitate all of the trolley poles in the City that are not to be replaced under the Power Improvement Program or other federal grant.

HH-576 - Hughes Leithold and Foothill Waterlines
Replace and Repair

Design work on this project involved research into the actual loss of water from natural springs that resulted from the construction of the Foothill Tunnel in the 1930's, and included field surveys to the existing temporary supply system.

POWER IMPROVEMENT PROGRAM

Work during fiscal year 1976-77 under the UMTA-approved Federal Grant for the Power Improvement Program was as follows:

1. Grant Amendment

Amendment No. 2 to the Project Grant was approved by UMTA on July 21, 1976. This final amendment provides sufficient funds for the balance of the Project and increases the total Project Cost to \$50.5 million and the Federal Grant to \$36.5 million.

2. Project Status

As of the end of the fiscal year, approximately \$26.5 million has been expended or encumbered. The professional services contracts for engineering design are 90 percent completed. Twenty-seven contracts for construction work and material purchases have been completed and twenty-two are currently in progress. Electrification of the Market Street Subway and Twin Peaks Tunnel is nearly completed. Ten of the eighteen substations are under construction, with three completed and in service. Thirty miles of the eventual fifty miles of underground duct lines are completed or under construction. Approximately 35 percent of the underground feeder cable has been installed and an additional 20 percent is on order for delivery to current installation contractors. The conversion of the streetcar overhead trolley system for pantograph operation is progressing with all work on the "K" Line under construction, the "N" Line ready for bid and the "J", "L" and "M" Lines in the final design stages. Details of the various projects and contracts are in the following sections.

3. Electrification and Overhead Conversion

A) Contracts

Construction was essentially completed on Contract HH-521, Market Street Subway Electrification, Embarcadero Station to Duboce Portal. Modification of Contract No. 5, in the amount of \$122,690, for corrective work required for final alignment of the catenary system to suit field conditions, was approved by UMTA on June 9, 1977. The Contractor commenced work on the modification.

Construction neared completion on Contract HH-531, Market Street Subway Electrification, Duboce Junction to Eureka Station.

All PIP work included in Contract MR-622R, Twin Peaks Tunnel Electrification, Structural Repairs and Improvements was completed on June 17, 1977.

JUNIPERO SERRA BLVD. LOOKING NORTH FROM OCEAN AVE.



BEFORE-Overhead feeder cables and streetcar trolley overhead



AFTER-New trolley/streetlight poles and pantograph type overhead

Plans and specifications for Contract HH-524, K Line Streetcar Overhead System, Conversion for Pantograph Operation, were completed and transmitted to UMTA for approval on November 2, 1976. Following approval of plans and specifications by UMTA, bids were received on December 2, 1976. The contract was awarded on December 14, 1976 to Amelco Electric, San Francisco, California, who submitted the low bid of \$239,000. The contract was certified by the City Controller on January 24, 1977. Construction commenced on February 21, 1977.

Plans and specifications for Contract HH-536, Streetcar Overhead System, West Portal Avenue, Conversion for Pantograph Operation, were completed and transmitted to UMTA for approval on July 28, 1976. Following approval of plans and specifications by UMTA, bids were received on August 26, 1976. The contract was awarded on September 14, 1976 to Mahoney Electric Co. Inc., San Francisco, California, who submitted the low bid of \$295,671. The contract was certified by the City Controller on October 21, 1976. Construction commenced on November 8, 1976.

Construction was completed on Contract HH-517, K-Line Transit Power Facilities, Street Lighting and Related Work. Included was the installation of new trolley poles and overhead trolley wire reconstruction for pantograph operation on Junipero Serra Boulevard.

Construction on Contract MR-620, "K" Line, Ocean Avenue at Route 280 Overpass, Track Reconstruction and power Facilities, was completed. Included was overhead trolley wire reconstruction for pantograph operation.

Final contract documents for Purchase Contract No. 1 for Special Trolley Coach/Streetcar Crossing Hardware were completed and transmitted to the City Purchaser. The special hardware will be purchased by the City, due to the six-month manufacturing lead time, and will be furnished to several installation contractors. The contract was advertised by the City Purchaser on October 4, 1976. Bids were received on October 29, 1976. The contract was awarded to Ohio Brass Co., who submitted the sole bid in the amount of \$20,049. The manufacturer, Ohio Brass Co., completed fabrication of the special trolley coach/streetcar crossing hardware and delivery was made on June 8, 1977.

Final contract documents for Purchase Contract No. 2 for Special Trolley Coach/Streetcar Crossing Hardware were

completed and transmitted to the City Purchaser. Bids were received on May 20, 1977. On June 27, 1977, the City Purchaser awarded the contract to Ohio Brass Co., who submitted the low bid of \$24,275.

During this year, the Municipal Railway outfitted an existing PCC streetcar with an LRV pantograph, floodlights, and an observation window in the roof. The location of the pantograph on this PCC is essentially identical to its location on the new LRV streetcars now being manufactured for the City of San Francisco. This car was and will be used by Hetch Hetchy as an overhead trolley system test car, testing the catenary systems installed in the Market Street Subway and Twin Peaks Tunnel and testing the surface overhead trolley systems being converted for pantograph operation under various contracts. The car will remain in regular passenger service except when required for testing.

B) Design

The Consultant, PBQ&D, Inc. and Gibbs & Hill, Inc. (PBGH) continued work on final design contract plans and specifications.

Hetch Hetchy review continued on plans and specifications at the 95 percent completion level as submitted by the Consultant for streetcar overhead system conversion for pantograph operation for Contracts HH-530 ("J" Line - Duboce to 17th Street), HH-532 ("N" Line), HH-533 ("J" Line), HH-534 ("L" Line), and HH-535 ("M" Line), with emphasis on Contract HH-532 ("N" Line).

Review was completed on the 95 percent completion level plans and specifications for Contract HH-532, "N" Line Streetcar Overhead System, Church Street to Nineteenth Avenue, Conversion for Pantograph Operation, and Sunset Tunnel Electrification. Comments were transmitted to the Consultant, PBGH, for incorporation into the final contract documents. Following return of plans and specifications from the Consultant, with corrections, preparation of final contract documents commenced. Contract is scheduled to be advertised in August 1977.

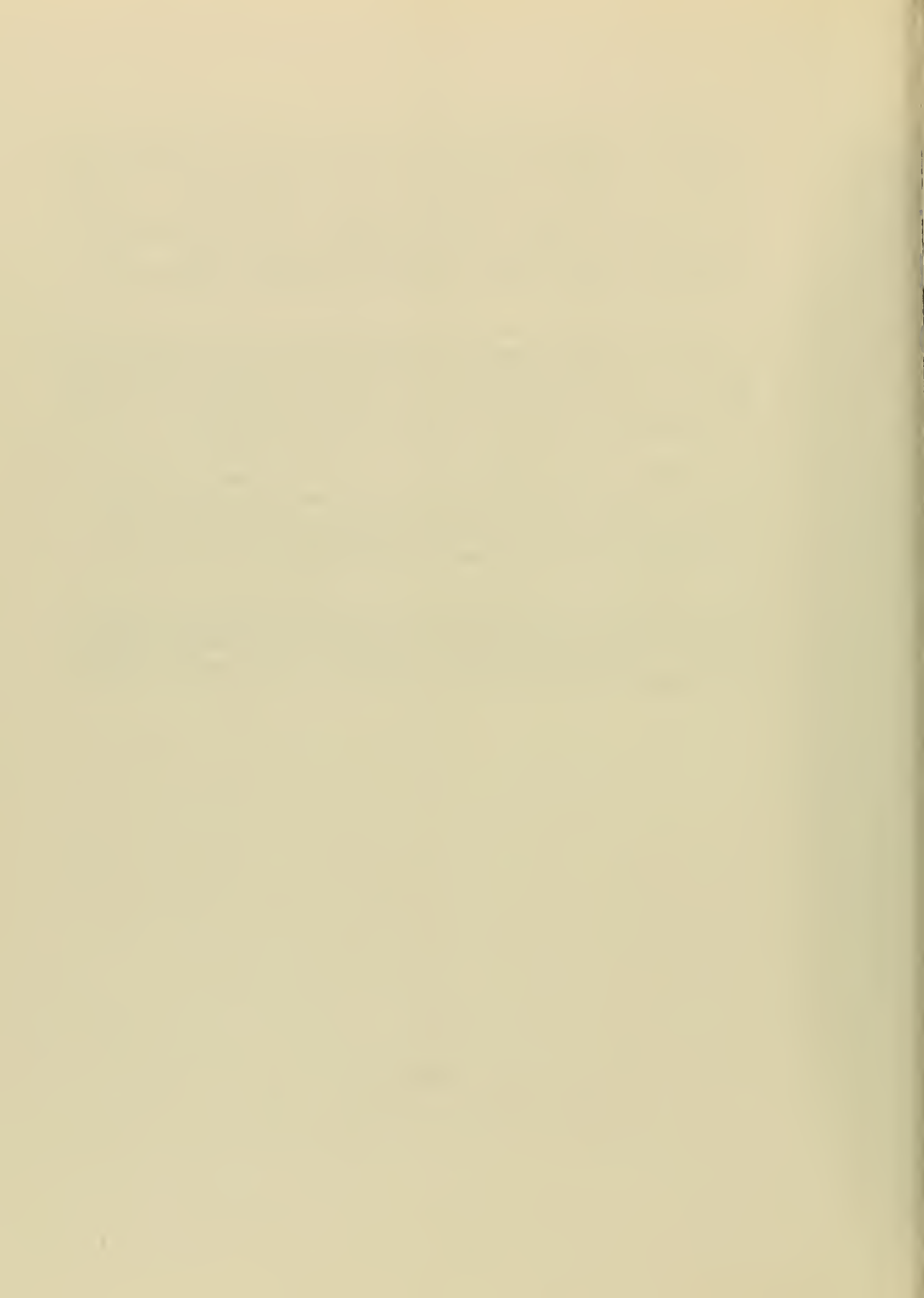
Plans and specifications to be included in DPW Contracts 23,919 and 23,920 - Judah Street, 19th to 32nd Avenue and 32nd Avenue to La Playa, Street Improvement and Track Reconstruction, were completed and transmitted to the Department of Public Works. The work to be included consists of replacement of trolley poles and conversion of the streetcar overhead system for pantograph operation.

This work was formerly part of Contract HH-532, and the plans and specifications were prepared by the Consultant, PBGH. The plans and specifications were approved by UMTA on May 13, 1977, and June 27, 1977 respectively. Plans and specifications for DPW Contract 23,919 were approved by the State (FAU) on June 23, 1977. The contract is scheduled to be advertised by DPW in July 1977. Advertising of DPW Contract 23,920 is awaiting approval by the State (FAU).

Plans and specifications for new trolley pole foundations on the "M" Line from St. Francis Circle to Junipero Serra Boulevard were completed and delivered to Muni (TIP) on May 27, 1977 for inclusion in Contract MR-643, "M" Line Rerailing. The new trolley poles and overhead conversion work will be done later under Contract HH-535.

Plans and specifications were completed and transmitted to Muni (TIP) on March 31, 1977 for Contract MR-642, West Portal Avenue, Track Reconstruction. The work to be included consists of the relocation of the streetcar overhead to suit the new track alignment.

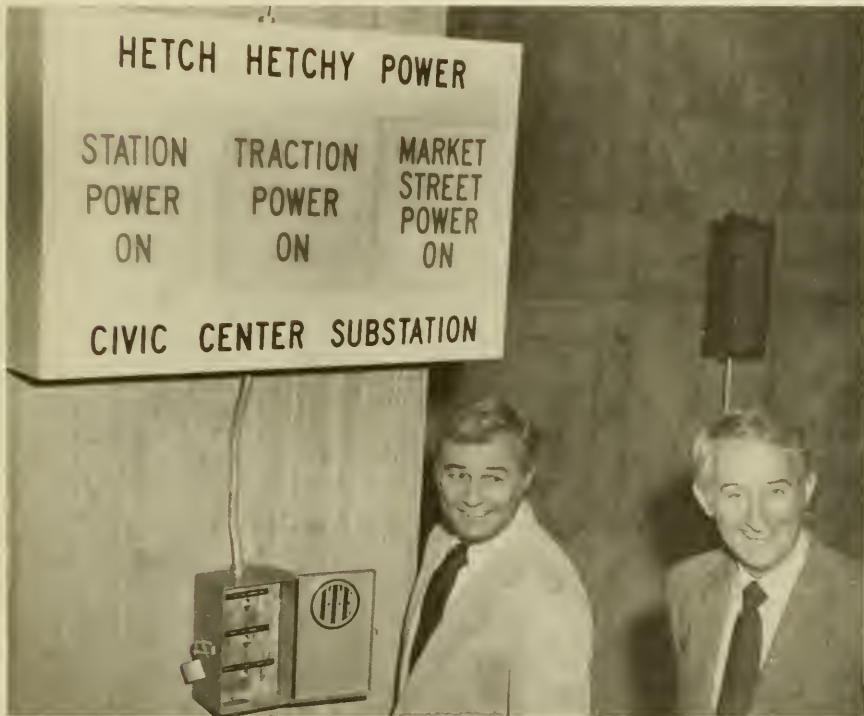
The Consultant completed work of determining the nature, degree, cause and correction of deviations in catenary construction from contract designs in the Market Street Subway. Drawings for the corrective work were completed and issued to the Contractors.



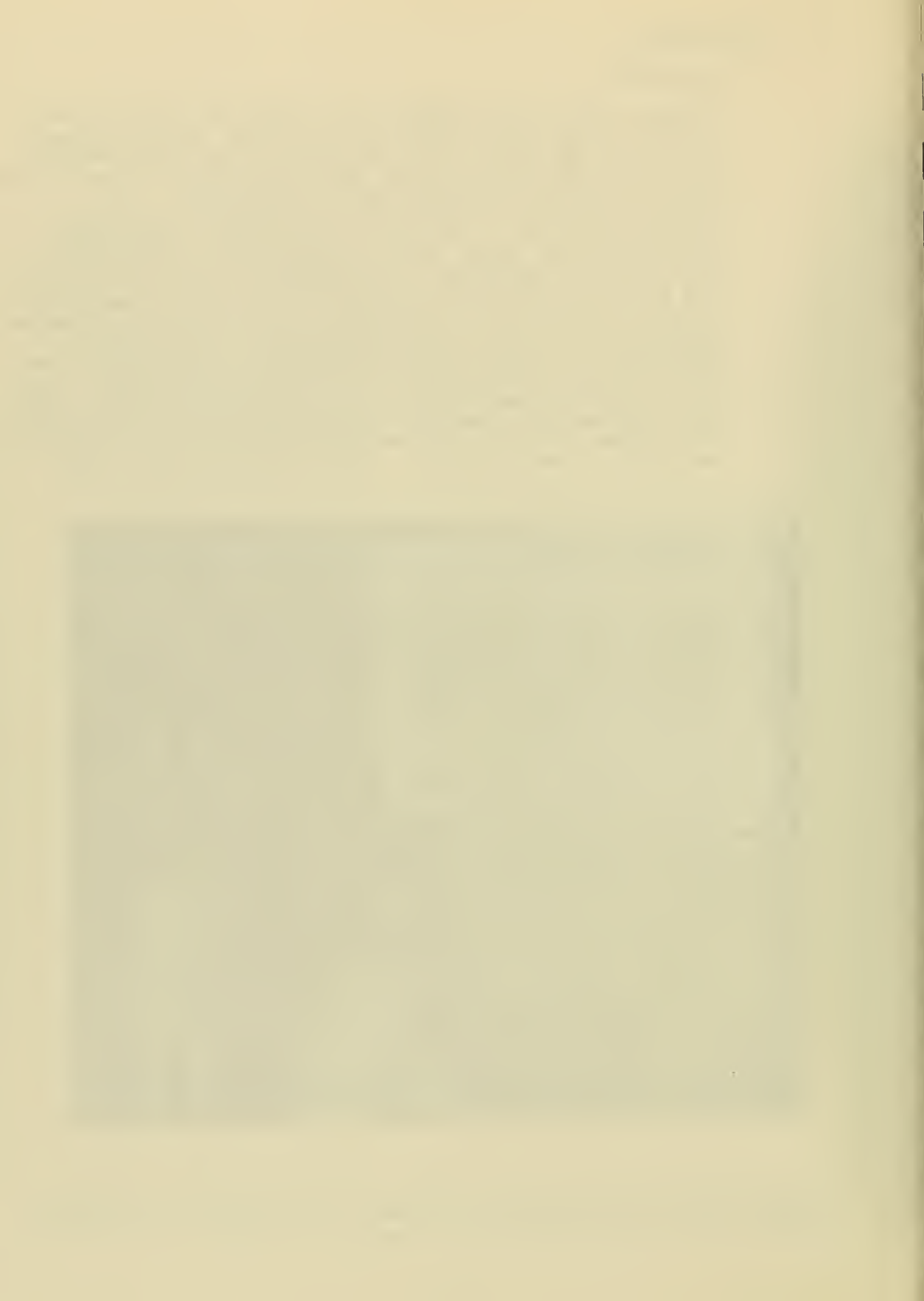
4. Substations

A) Contracts

Construction neared completion on Contract HH-522, Civic Center, Church, and Downtown Substations, Installation of Electrical Equipment. The Contractor completed installation of substation equipment and performed pre-energization tests at Church and Civic Center Substations. On November 23, 1976, the Civic Center Substation was dedicated and Unit No. 2 (12 kV ac switchgear, transformer, 4000 kw silicon diode rectifier and 600 V dc switchgear) was placed in operation. On December 23, 1976, Unit No. 1 (12 kV ac switchgear, transformer, 4000 kw silicon diode rectifier and 600 V dc switchgear) was placed in operation. On March 21, 1977, the second major unit of the Power Improvement Program, Church Substation, consisting of two 4000 kw transformer-rectifier units and associated 12 kV ac and 600 V dc switchgear, was placed in operation. Unit No. 1, Phase I at Downtown Substation (12 kV ac switchgear, transformer, 4000 kw silicon diode rectifier and 600 V switchgear) was inspected, tested and on July 22, 1976



The Honorable George Moscone, Mayor, and Oral L. Moore, General Manager, Hetch Hetchy Water and Power, at the dedication ceremony of the Civic Center Substation, November 23, 1976.



placed in operation and began supplying 600-volt dc power to Muni vehicles on lower Market Street and adjacent areas. Installation of Unit 1, Phase I equipment completed the first of four phases required to replace the obsolete rotating machines with modern equipment while keeping the substation in operation. The Contractor completed the removal of the old equipment and prepared for installation of the remainder of the new equipment in the final Phase IV of the conversion.

Construction neared completion on Contract HH-528, Laguna Honda and Judah Substations, Construct Buildings and Install Equipment. On April 29, 1977 Judah Substation was energized and load tested. This single-unit 4000 kw rectifier substation began providing power for the "N" Line streetcars on Judah Street from 20th Avenue to La Playa on May 3, 1977.

Construction commenced on Contract HH-529, Carl Substation, Construct Building and Install Equipment, on July 19, 1976.

Bids were received on July 15, 1976 for Contract HH-544, Fillmore Substation, Construct Building and Install Equipment. The contract was awarded on July 27, 1976 to Herrero Brothers, Inc., San Francisco, California, who submitted the low bid of \$641,840. The contract was certified by the City Controller on August 25, 1976. Construction commenced on September 13, 1976.

Plans and specifications for Contract HH-546, Randolph Substation, Construct Building and Install Equipment, were completed and transmitted to UMTA for approval on November 8, 1976. The plans and specifications were approved by UMTA on November 24, 1976. Bids were received on January 13, 1977. The contract was awarded on January 25, 1977 to Kaplan-Jones, Joint Venture, who submitted the low bid of \$226,900. The contract was certified by the City Controller on February 14, 1977. Construction commenced on March 7, 1977.

Plans and specifications for Contract HH-547, San Jose Substation, Install Equipment, were completed and transmitted to UMTA for approval on September 14, 1976. The plans and specifications were approved by UMTA on September 28, 1976. Bids were received on October 14, 1976. The contract was awarded on October 26, 1976 to L. K. Comstock & Co., Inc., who submitted the low bid of \$84,790. The contract was certified by the City Controller on February 3, 1977. Construction commenced on February 28, 1977.

Plans and specifications for Contract HH-548, Taraval Substation, Construct Building and Install Equipment, were completed and transmitted to UMTA for approval on January 11, 1977. The plans and specifications were approved by UMTA on February 3, 1977. Bids were received on February 24, 1977. The contract was awarded on March 8, 1977 to J. DiGiorgio & Sons, who submitted the low bid of \$253,950. The contract was certified by the City Controller on March 23, 1977. Construction commenced on April 18, 1977.

B) Design

The Consultant, Bechtel, Inc., completed design work on the substation buildings and equipment installation.

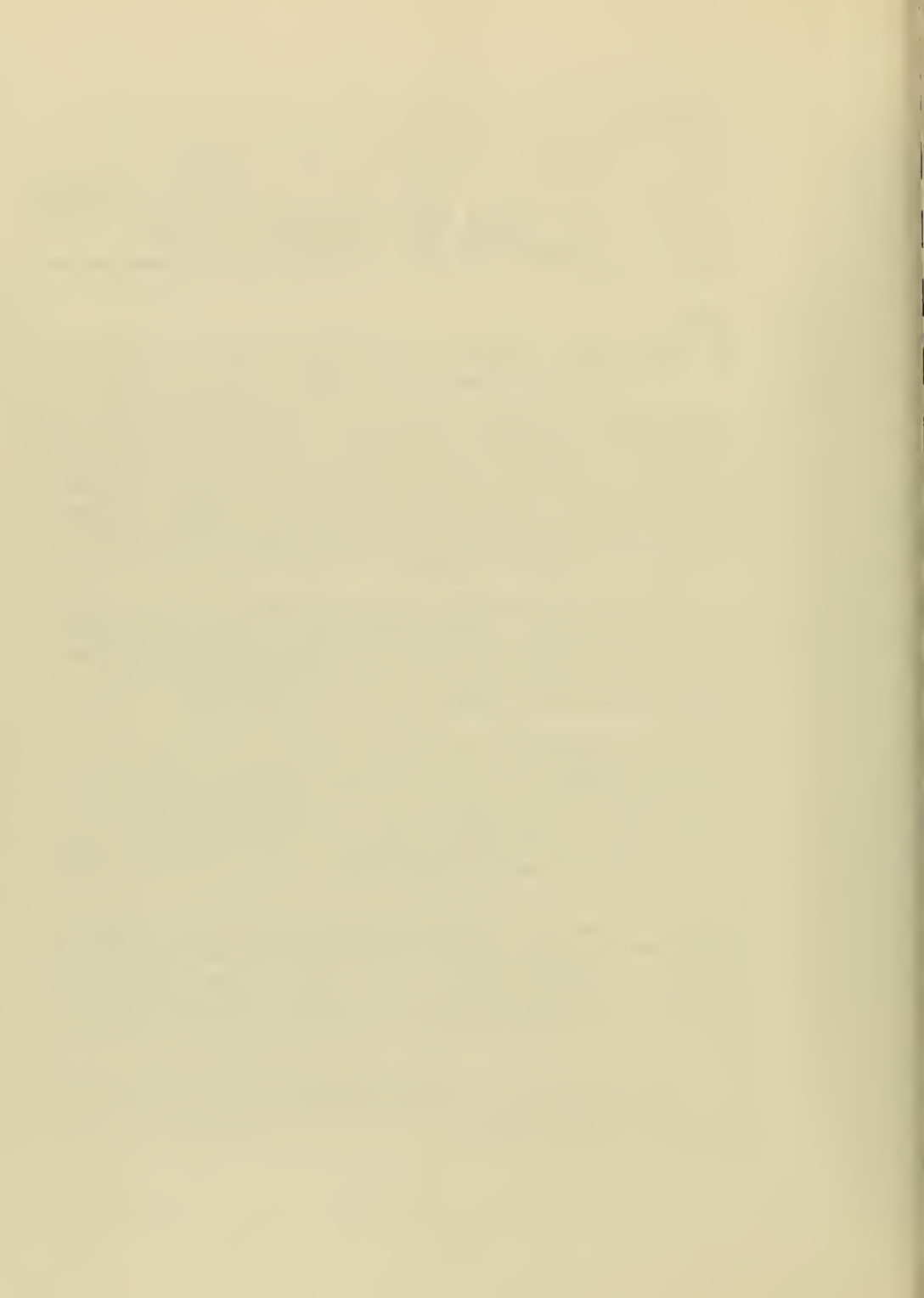
Final plans and specifications for Contract HH-549, Bryant Substation, Construct Building and Install Equipment, were received from the Consultant in May 1977. The plans and specifications will be included in one contract for the construction of the Bryant Substation and Power Control Center Building. The design for the Power Control Center portion of the building is nearing completion by Hetch Hetchy Engineering personnel.

Final plans and specifications for Contract HH-550, West Portal Substation, Install Equipment, were received from the Consultant in October 1976. Advertising of the contract must be deferred until the structure, which is a part of the new West Portal Station being constructed by BART, is completed sufficiently in early 1978.

Final plans and specifications for Contract HH-551, Richmond Substation, Install Equipment, were received from the Consultant in April 1977. Advertising of the contract must be deferred until the new West Portal Substation is completed in 1978, and the equipment from the existing West Portal Substation will be available for relocation to Richmond Substation.

Advertising of Contract HH-545, Outer Mission Substation, Install Equipment, is being deferred until the completion of the new San Jose Substation under Contract HH-547. The plans and specifications for HH-545 were previously completed by the Consultant. This is necessary so that the Outer Mission Substation can be shut down during reconstruction and its load temporarily assumed by the San Jose Substation.

The building design for the new combined Bryant Substation and Power Control Center received approval from the San Francisco Art Commission.



The City Planning Commission issued a negative declaration of environmental impact and approved the project as conforming to the Master Plan.

C) Equipment Purchase

The substation equipment manufacturer, ITE-Gould, completed production on the \$5,896,000 purchase contract.

Review of shop drawings submitted by ITE-Gould was completed.

Negotiations were conducted with ITE-Gould for a contract modification to provide additional equipment for Laguna Honda Substation. The second rectifier, transformer and related switchgear to be purchased will provide power reliability in the Twin Peaks Tunnel. This addition to the Project was approved by UMTA in the Grant Amendment.

Deliveries of equipment under the purchase contract were virtually completed. Equipment for Laguna Honda, Judah and Downtown Substations were received by the Contractors, Herrero Brothers, Inc. (Laguna Honda and Judah) and DeNarde Construction Co. (Downtown) and is being installed. This completed delivery to the site for five substations. For the remaining substations, all items of the equipment, except for minor shortages, are on hand at the local warehouse for later pickup by the installation contractors.

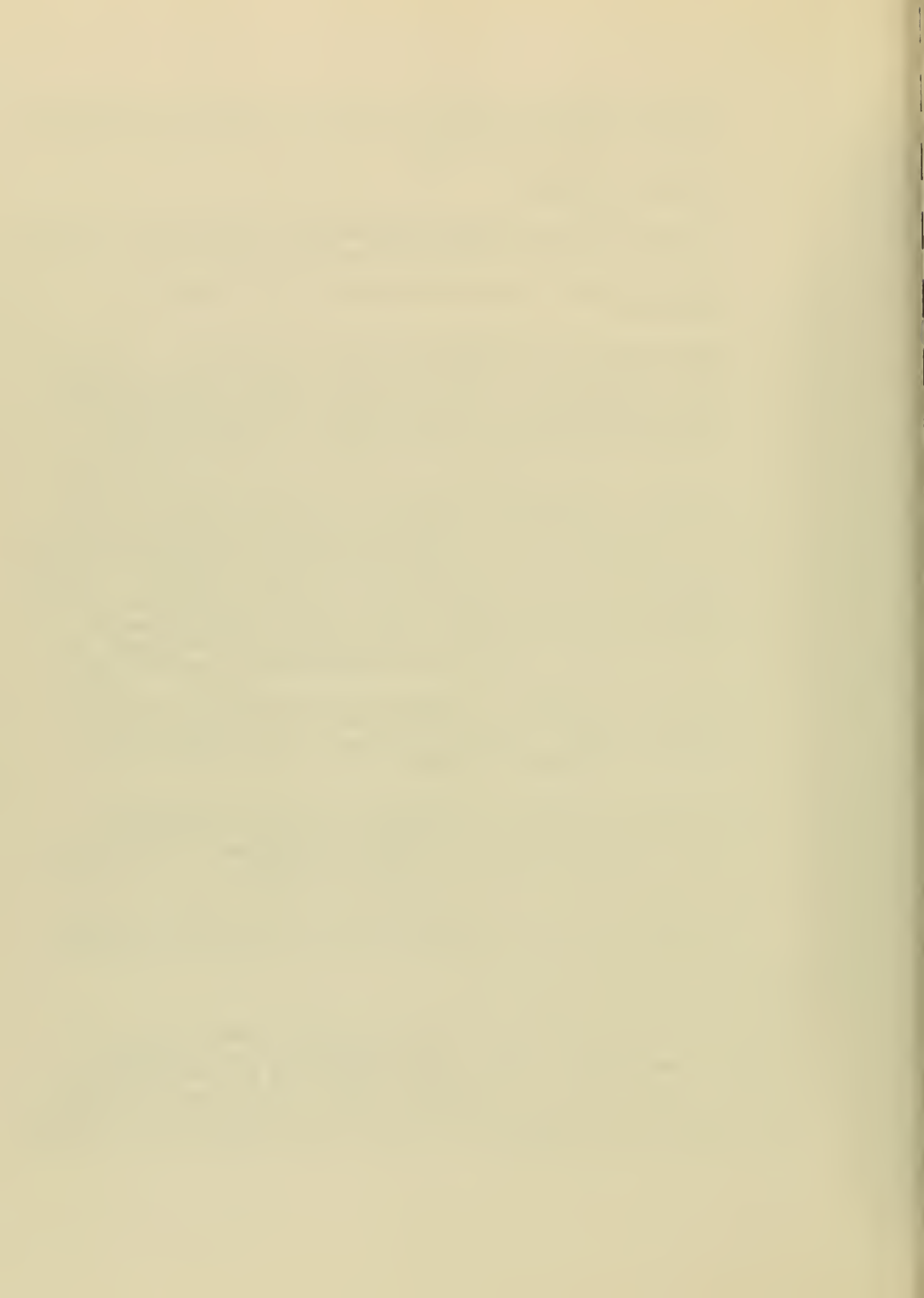
Meetings were held with factory representatives from ITE-Gould to resolve outstanding minor problems that have developed during installation and initial operation of the new substation equipment.

The Service Engineer, assigned by ITE-Gould to assist during installation and testing of the new equipment, continued to provide assistance at Downtown, Civic Center, Church, Laguna Honda and Judah Substations.

Work continued on the preparation of plans and specifications for the purchase of additional substation equipment for Stations E, F, J and N.

5. Control and Communications

Plans and specifications at the 90 percent completion level for Contract HH-569, Supervisory Control System, Equipment Purchase and Installation, were resubmitted by the Consultant, Systems Control, Inc., in January 1977. Review was completed, and the plans and specifications were returned to the Consultant with comments and corrections to be incorporated into the final plans and specifications.



Plans and specifications at the 90 percent completion level for Contract HH-574, Communication Cable and Subway Maintenance Telephone System, Installation Contract No. 1, were submitted by the Consultant. Review was completed and the plans and specifications were returned to the Consultant with comments to be incorporated into the final plans and specifications.

Amendment No. 1 to the existing professional services agreement was negotiated with the Consultant. The amendment provides for additional design services necessary to extend the supervisory control system to the four additional substations - E, F, J and N, recently added to the PIP, and to increase the flexibility of the maintenance telephone system. The amendment which increases the total cost of the agreement from \$85,895 to \$93,607, was approved by the PUC on August 24, 1976, and was certified by the City Controller on September 28, 1976.

6. Cable Purchase

Orders totaling 370,000 feet of insulated power cable were placed during the fiscal year for contracts in progress that require City-furnished cable. A total of approximately 780,000 feet of cable has been purchased under the contract with Cyprus Wire & Cable Company, which expired on June 30, 1977. Efforts to extend the contract were unsuccessful.

Contract documents were prepared and transmitted to UMTA on June 13, 1977 for a new contract to provide the estimated 650,000 feet of cable required to complete the planned work under the Power Improvement Program. The contract documents were approved by UMTA on June 21, 1977. Bids are scheduled to be received by the City Purchaser on July 8, 1977.

7. Feeder Undergrounding

A) Church Street - 22nd Street to 30th Street - Underground Duct System (Contract HH-497)

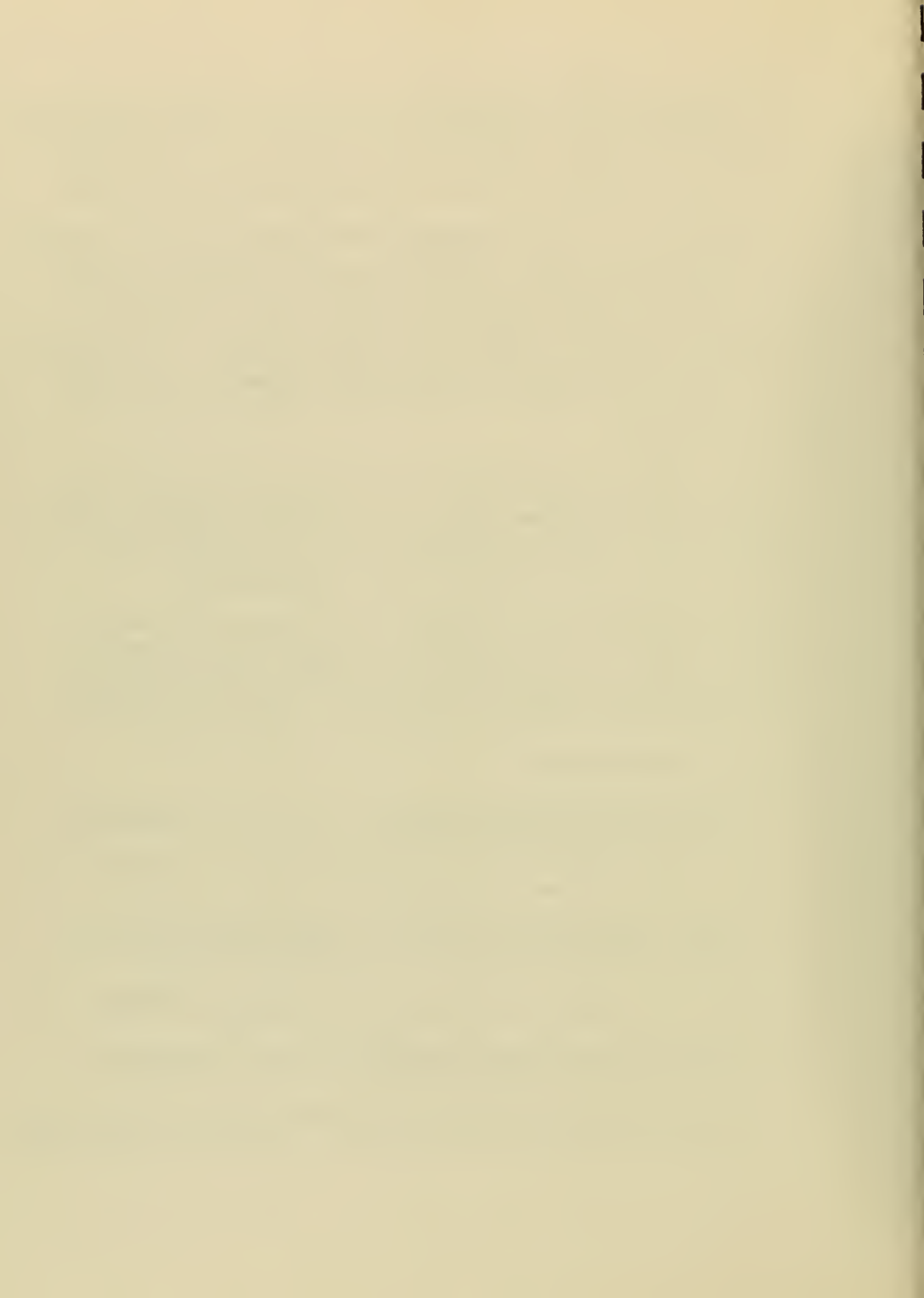
All work on this contract was completed in accordance with contract plans and specifications on July 14, 1976.

B) Taraval Street and 46th Avenue - 20th Avenue to Vicente Street - Underground Duct System (Contract HH-503)

All work on this contract was completed in accordance with contract plans and specifications on October 8, 1976.

C) K-Line, Transit Power Facilities, Street Lighting and Related Work (Contract HH-517)

All work on this contract was completed in accordance with contract plans and specifications. Included was underground



feeder cable installation in previously constructed duct banks on West Portal and Ocean Avenues and Junipero Serra Boulevard.

D) Sutter - Presidio Avenue to Leavenworth - Underground Duct System (Contract HH-525)

All work on this contract was completed in accordance with contract plans and specifications on September 14, 1976.

E) McAllister Street - Divisadero to Leavenworth - Underground Duct System (Contract HH-526)

All work on this contract was completed in accordance with contract plans and specifications on November 24, 1976.

F) Ashbury, Fillmore, Church, 18th and Other Streets Underground Duct System (Contract HH-526)

All work on this contract was completed in accordance with contract plans and specifications on January 13, 1977.

G) K-Line, Ocean Avenue at Route 280 Overpass, Track Reconstruction and Power Facilities (Contract MR-620)

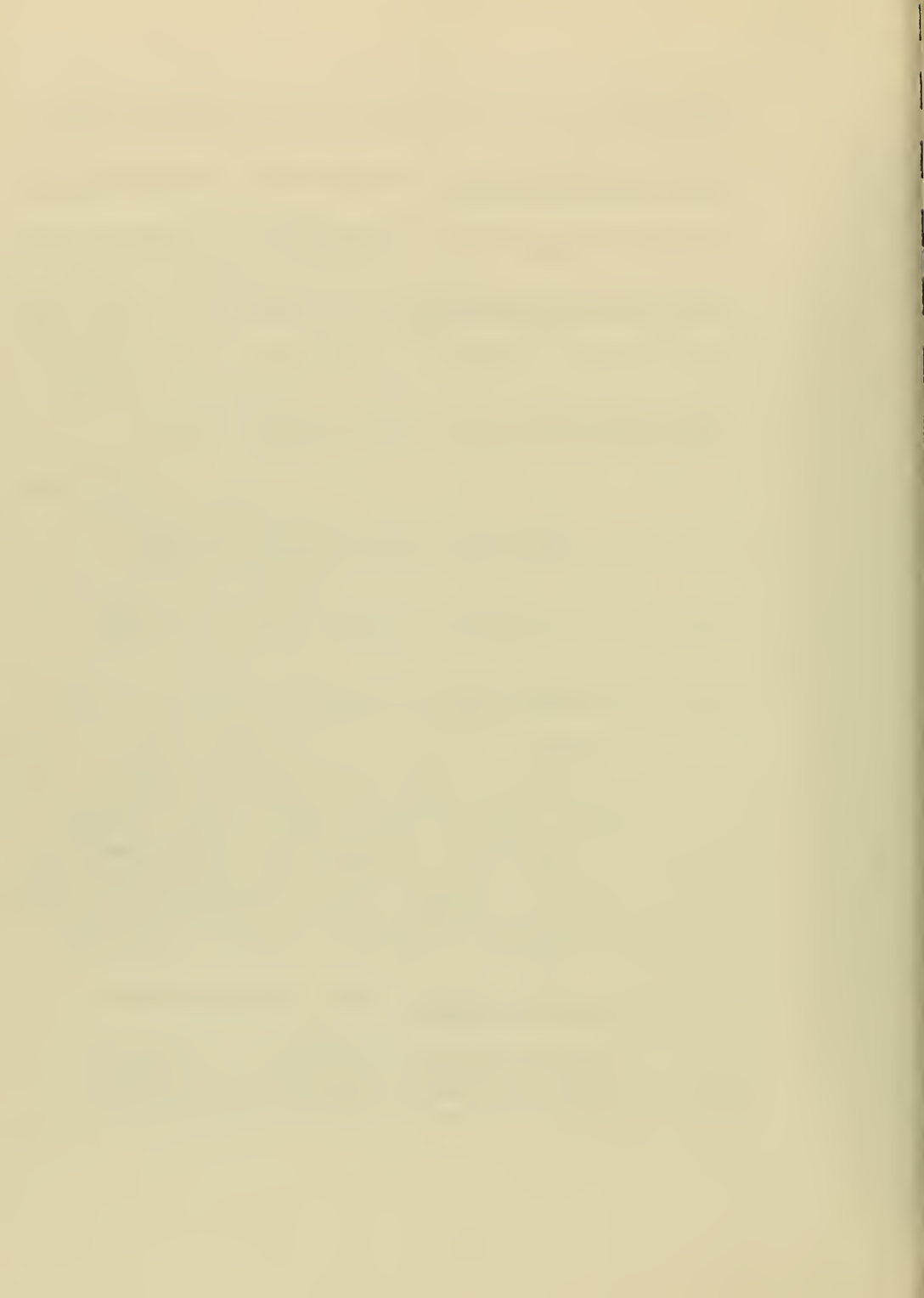
All work on this contract was completed in accordance with contract plans and specifications. Included was the construction of underground duct lines.

H) Ocean Avenue and Phelan Avenue Rechannelization and Track Reconstruction (DPW Contract 23,727)

Bids were received on August 4, 1976 for DPW Contract 23,727 for Ocean and Phelan Avenues Rechannelization, which includes relocation of trolley poles and the overhead trolley wire system and the undergrounding of feeder cables, along with Muni streetcar track relocation and rerailing. The contract was awarded on September 3, 1976 to Homer J. Olsen, Inc., Union City, California, who submitted the low bid of \$1,415,831. The amount bid for the PIP work included in the contract was \$63,962. The contract was certified by the City Controller on November 8, 1976. Construction commenced on November 10, 1976.

I) Judah Street - 20th to 48th Avenues - Underground Power Facilities (Contract HH-523)

Plans and specifications for construction of manholes and underground duct banks and the installation of feeder cables and related work were completed and transmitted to UMTA for approval on November 22, 1976. Included in the



contract to be funded under the Transit Improvement Program is the furnishing and installing of new trolley/streetlight poles and the furnishing and installing of new feed spans and related work. The plans and specifications were approved by UMTA on December 1, 1976. Bids were received on December 16, 1976. The contract was awarded on January 11, 1977 to L. K. Comstock & Company, Inc., San Francisco, California, who submitted the low bid of \$355,462. The contract was certified by the City Controller on February 8, 1977. Construction commenced on February 28, 1977.

J) Sutter, McAllister and Fillmore Streets - Underground Power Facilities and Related Work (Contract HH-540)

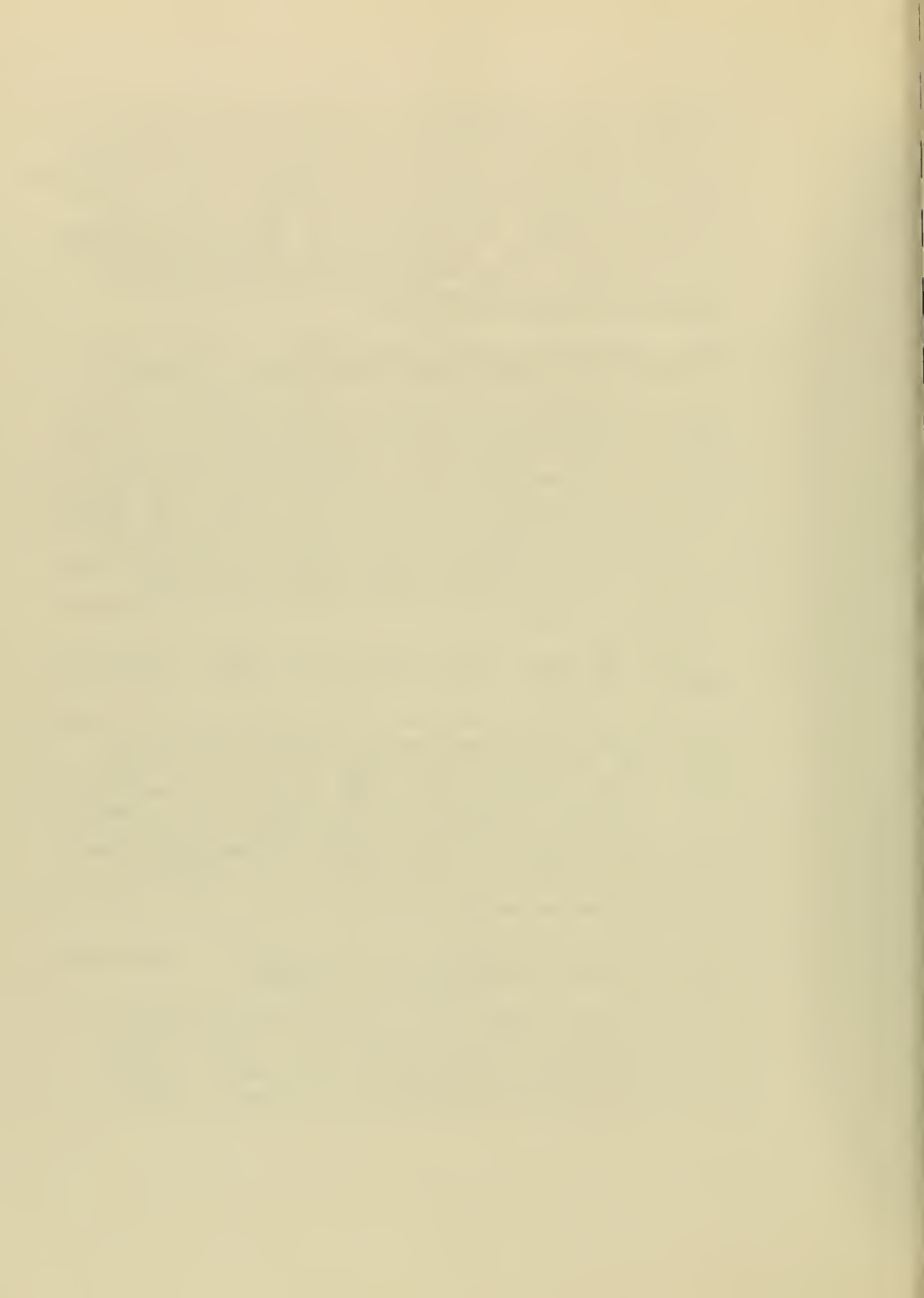
Plans and specifications for the installation of feeder cables in duct banks constructed under Contracts HH-525 and HH-526 were completed and transmitted to UMTA for approval on August 23, 1976. The plans and specifications were approved by UMTA on September 8, 1976. Bids were received on September 16, 1976. The contract was awarded on September 28, 1976 to Abbett Electric Corporation, San Francisco, California, who submitted the low bid of \$238,495. The contract was certified by the City Controller on October 14, 1976. Construction commenced on November 8, 1976.

K) J, N, No. 22 and 33 Lines, Underground Power Facilities (Contract HH-552)

Plans and specifications for installation of feeder cables in duct banks constructed under Contracts HH-497 and HH-527, and in existing duct banks in Carl and Irving Streets, were transmitted to UMTA for approval on March 2, 1977. Following approval by UMTA, bids were received on March 31, 1977. The contract was awarded on April 12, 1977 to Amelco Electric, San Francisco, California, who submitted the low bid of \$238,950. The contract was certified by the City Controller on May 5, 1977. Construction commenced on May 23, 1977.

L) Folsom and Howard Streets, Eleventh Street to Main Street Underground Duct System (Contract HH-559)

Plans and specifications for constructing manholes and underground duct banks in Folsom and Howard Streets between Eleventh and Main Streets were completed and transmitted to UMTA for approval on August 23, 1976. The plans and specifications were approved by UMTA on



September 8, 1976. Bids were received on September 16, 1976. The contract was awarded on September 28, 1976 to McGuire & Hester, Oakland, California, who submitted the low bid of \$629,735. The contract was certified by the City Controller on October 25, 1976. Construction commenced on November 15, 1976.

M) Haight Street - Stanyan to Gough - Underground Duct System (Contract HH-560)

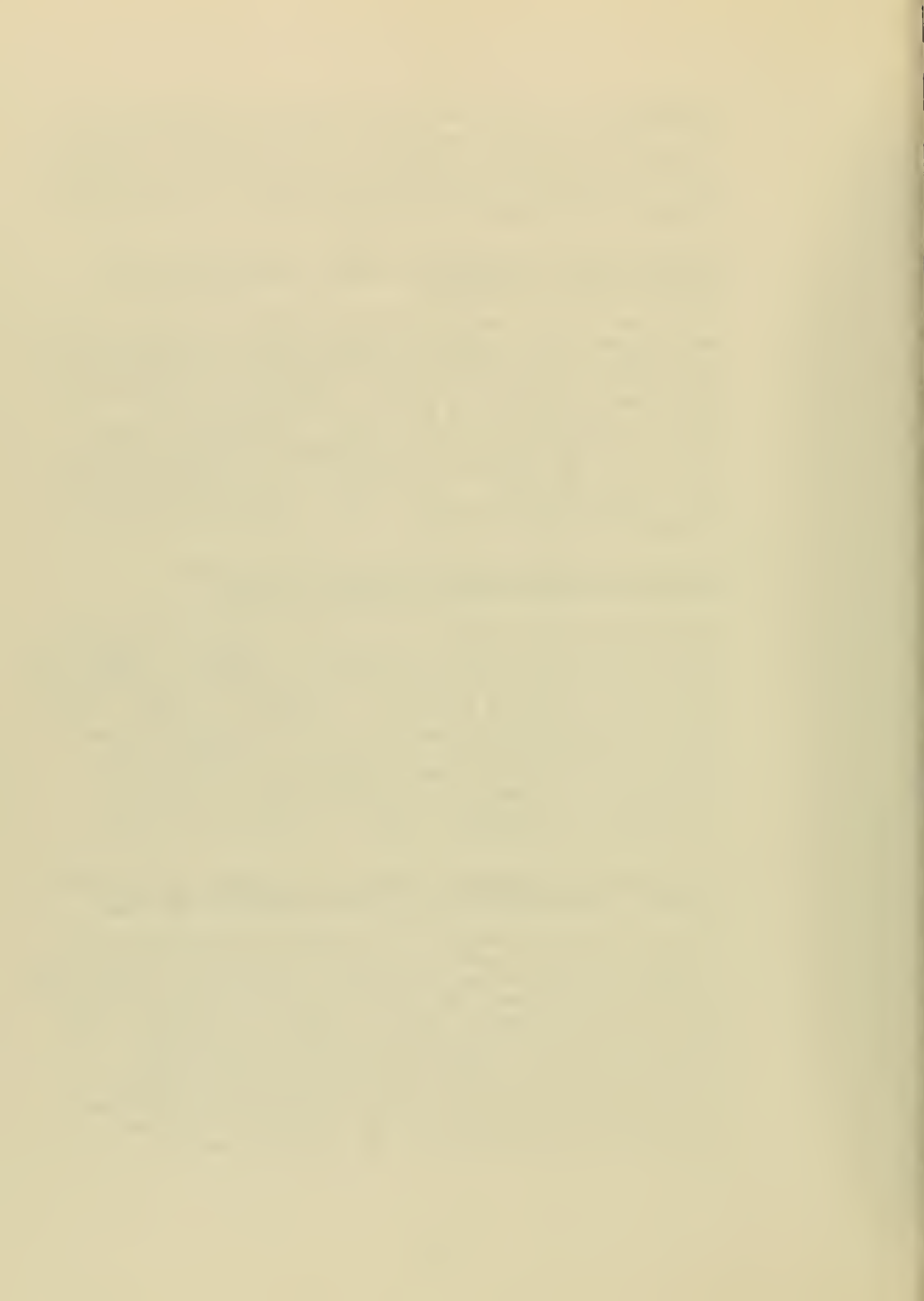
Plans and specifications for constructing manholes and underground duct banks in Haight Street, between Stanyan and Gough, were completed and transmitted to UMTA for approval on February 4, 1977. The plans and specifications were approved by UMTA on February 25, 1977. Bids were received on March 10, 1977. The contract was awarded on March 22, 1977 to Underground Construction Co., Inc., San Leandro, California, who submitted the low bid of \$329,847. The contract was certified by the City Controller on April 7, 1977. Construction work commenced on May 2, 1977.

N) Fillmore, Jackson, Presidio and Other Streets Underground Duct System (Contract HH-561)

Plans and specifications for constructing manholes and underground duct banks in Fillmore, Jackson, Presidio and other streets were completed and transmitted to UMTA for approval on October 29, 1976. The plans and specifications were approved by UMTA on November 10, 1976. Bids were received on December 2, 1976. The contract was awarded on December 14, 1976 to W. R. Thomason, Inc., Martinez, California, who submitted the low bid of \$614,000. The contract was certified by the City Controller on January 11, 1977. Construction work commenced on January 31, 1977.

O) Fulton and McAllister Streets - 8th Avenue to Divisadero Street - Underground Duct System (Contract HH-562)

Plans and specifications for constructing manholes and underground duct banks in Fulton and McAllister Streets between 8th Avenue and Divisadero Street were transmitted to UMTA for approval on April 5, 1977. The plans and specifications were approved by UMTA on April 19, 1977. Bids were received on May 12, 1977. The contract was awarded on May 24, 1977 to Amalgamated Superior Engineering, Inc., Oakland, California, who submitted the low bid of \$312,275. The contract was certified by the City Controller on June 10, 1977, and the Contractor was notified of the starting date of July 5, 1977.



P) Folsom Street - 11th to 16th Streets and 11th Street
Market to Bryant - Underground Duct System
(Contract HH-563)

Plans and specifications for constructing manholes and underground duct banks in Folsom Street between 11th and 16th Streets and in 11th Street between Market and Bryant were completed and transmitted to UMTA for approval on September 10, 1976. The plans and specifications were approved by UMTA on September 28, 1976. Bids were received on October 14, 1976. The contract was awarded on October 26, 1976 to Underground Construction Co., Inc., San Leandro, California, who submitted the low bid of \$169,075. The contract was certified by the City Controller on November 17, 1976. Construction work commenced on December 13, 1976. All work on this contract was completed in accordance with contract plans and specifications on April 14, 1977.

Q) Hayes Street - Van Ness to Stanyan - Underground Duct
System (Contract HH-567)

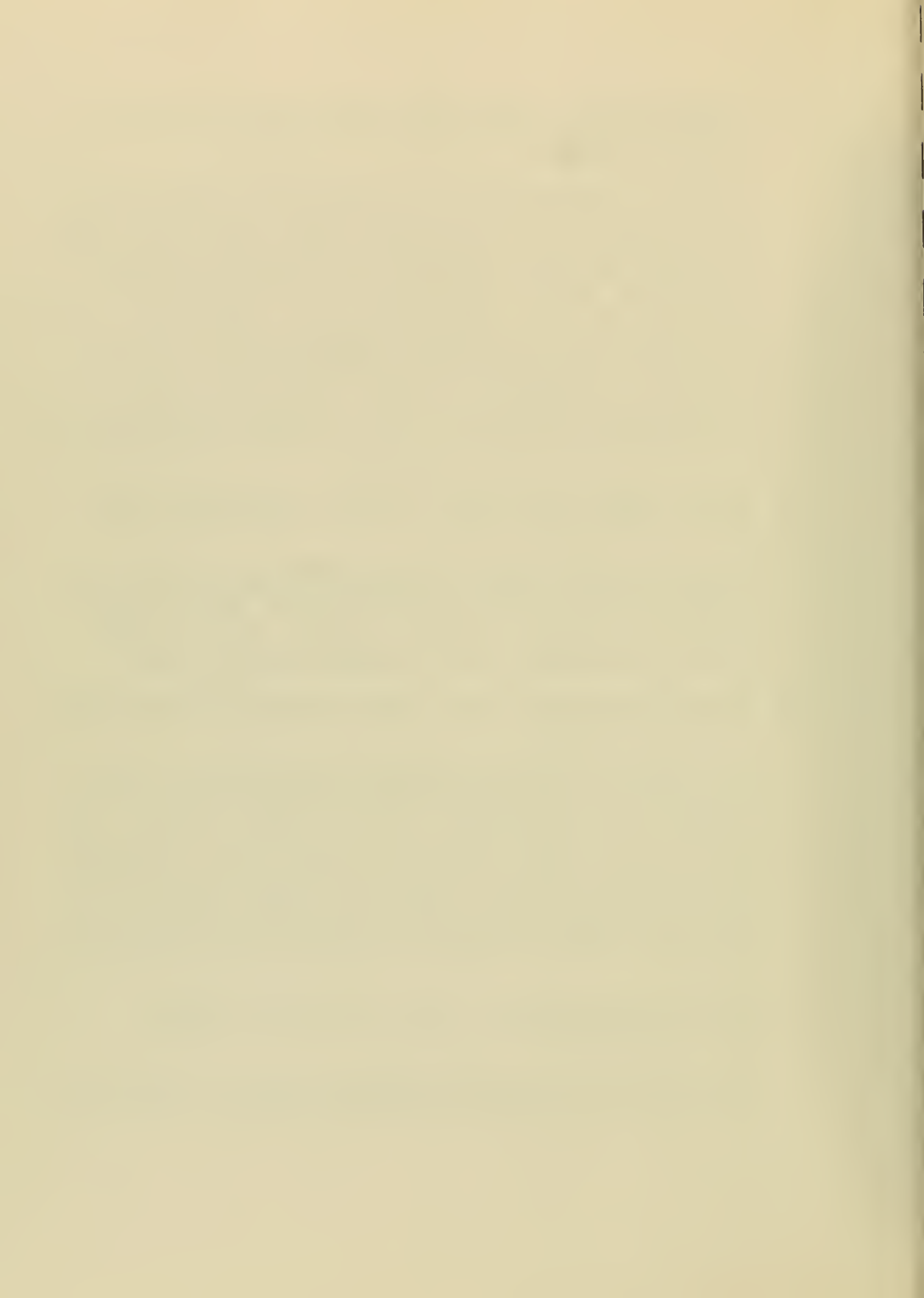
Plans and specifications for constructing manholes and underground duct banks in Hayes Street between Van Ness Avenue and Stanyan Street were completed and transmitted to UMTA for approval on June 2, 1977. The plans and specifications were approved by UMTA on June 21, 1977. Bids are scheduled to be received on July 21, 1977.

R) Broad Street and San Jose Avenue, M-Line Track Extension
(Contract MR-644)

Plans and specifications for the PIP portion of work to be included in Municipal Railway Contract MR-644, Broad Street and San Jose Avenue, M-Line Track Extension, were completed and transmitted to TIP on April 8, 1977. The work to be included consists of construction of manholes and underground duct banks in San Jose Avenue and Broad Street, from Plymouth Avenue to Mt. Vernon Avenue. This work was formerly part of Contract HH-558. Advertising by TIP for receipt of bids for this contract is awaiting approval by UMTA of amendment to System Improvement Program (SIP).

S) Feeder Undergrounding - Folsom and Howard Streets
(Contract HH-448)

Work continued on the preparation of plans and specifications for the installation of feeder cables in underground duct banks constructed under other contracts.



T) Ocean Avenue - Phelan Avenue to Outer Mission Substation
Underground Power Facilities and Related Work
(Contract HH-578)

Work commenced on the preparation of plans and specifications for the installation of feeder cables in duct banks constructed under DPW Contract 23,727 and Contracts MR-620 and HH-537. Also to be included in this contract will be the removal of overhead feeders on Ocean Avenue from Junipero Serra Boulevard to Mission Street and on San Jose Avenue between Ocean Avenue and Geneva Substation.

U) Union, Parnassus and Clayton Streets - Underground Duct
System (Contract HH-579)

V) Bryant, 16th, Mission, South Van Ness and Other Streets
Underground Duct System (Contract HH-580)

W) California Street - Parker to 32nd Avenue and 8th Avenue
California to Fulton - Underground Duct System
(Contract HH-581)

X) San Jose Avenue - Mt. Vernon Avenue to Metro Center
M-Line Track Extension (Future Municipal Railway Contract)

Work commenced on the preparation of plans and specifications for constructing manholes and underground duct banks. Feeder cables will be installed in these duct banks under later contracts.

Y) Other Work

Preliminary engineering and plans and specifications are proceeding for duct lines and feeder undergrounding in accordance with the requirements of the Program.

Z) Manhole Frames and Covers (Third Contract)

Bids were received on July 16, 1976 for purchasing an additional 200 sets of manhole frames and covers for use on future Power Improvement Program contracts. The contract was awarded to Neenah Foundry Company, Neenah, Wisconsin, who submitted the low bid of \$68,000. Delivery of the frames and covers was completed on February 28, 1977.

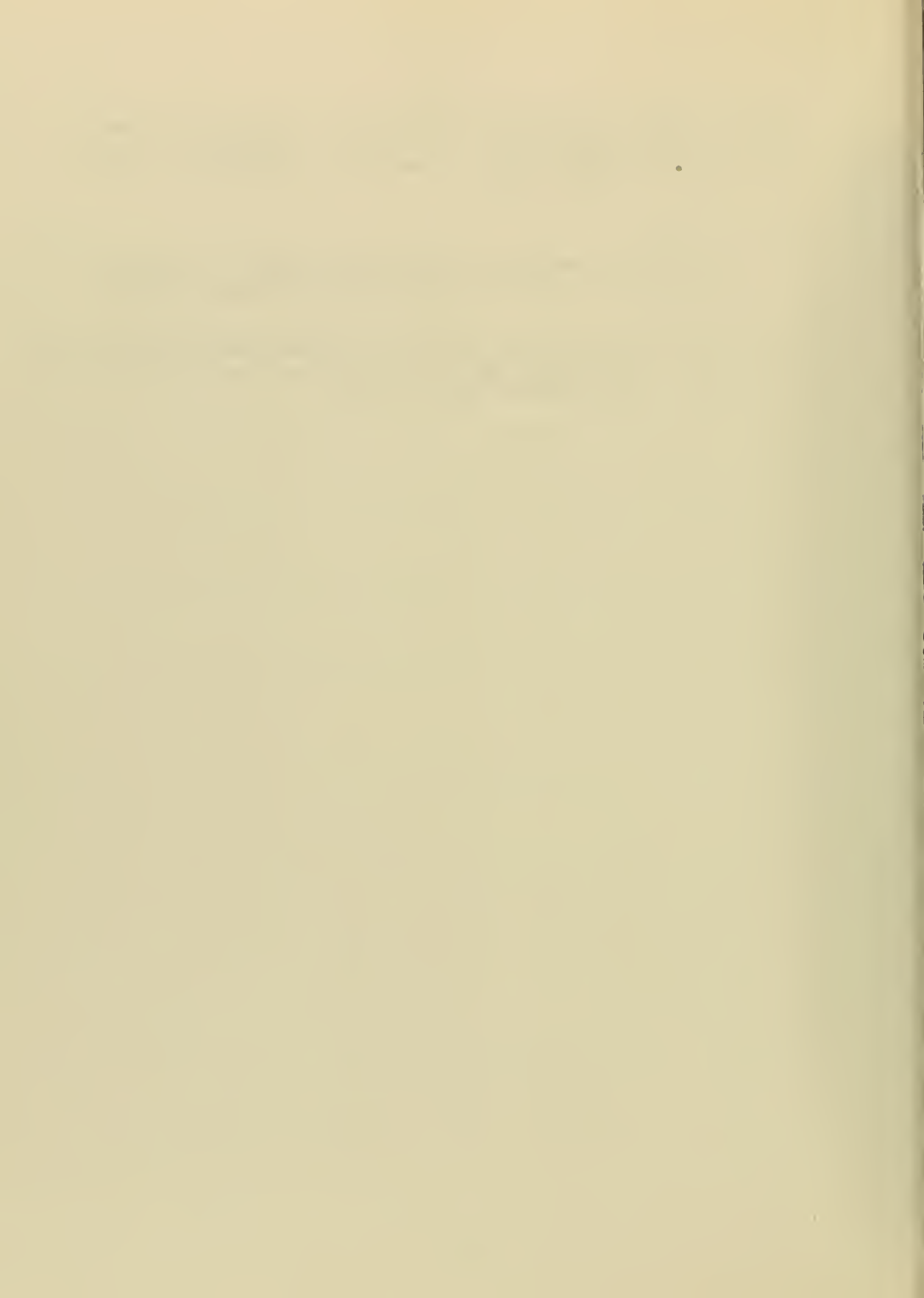
8. Transit Preferential Street Program: Mission Street and
Fourth Street, Muni Passenger Platforms and Muni Power
Facilities (DPW Contract 23,834)

Advertising of Department of Public Works (DPW) Contract No. 23,834, Transit Preferential Street Program: Mission

Street, Beale to South Van Ness Avenue; and Fourth Street, Market to Townsend, which includes the relocation of trolley coach overhead facilities, is awaiting scheduling by the Department of Public Works.

9. Miscellaneous

- A) Coordination meetings of the joint staffs of Transit Improvement Program and the Power Improvement Program were held.
- B) Coordination meetings were held between Hetch Hetchy staff and the Consultants on the electrification, substation and control and communication projects.



BUREAU OF LIGHT, HEAT AND POWER

STREET LIGHTING

General

The lighting of public streets within the City of San Francisco is provided by facilities which are, on a City-wide basis, 44.0 percent owned by the City; 54.2 percent owned by the Pacific Gas and Electric Company; and a small percentage, 1.8 percent, jointly owned. In the underground areas, where the economic advantage of City ownership is greatest, 82.4 percent of the lights are City-owned. Five years ago, the corresponding figure was 78.3 percent.

In fiscal year 1933-34, the cost for street lighting was \$1.25 per capita; last year, with approximately thirty times as much light on the streets and public thoroughfares, the cost per capita was approximately \$2.18.

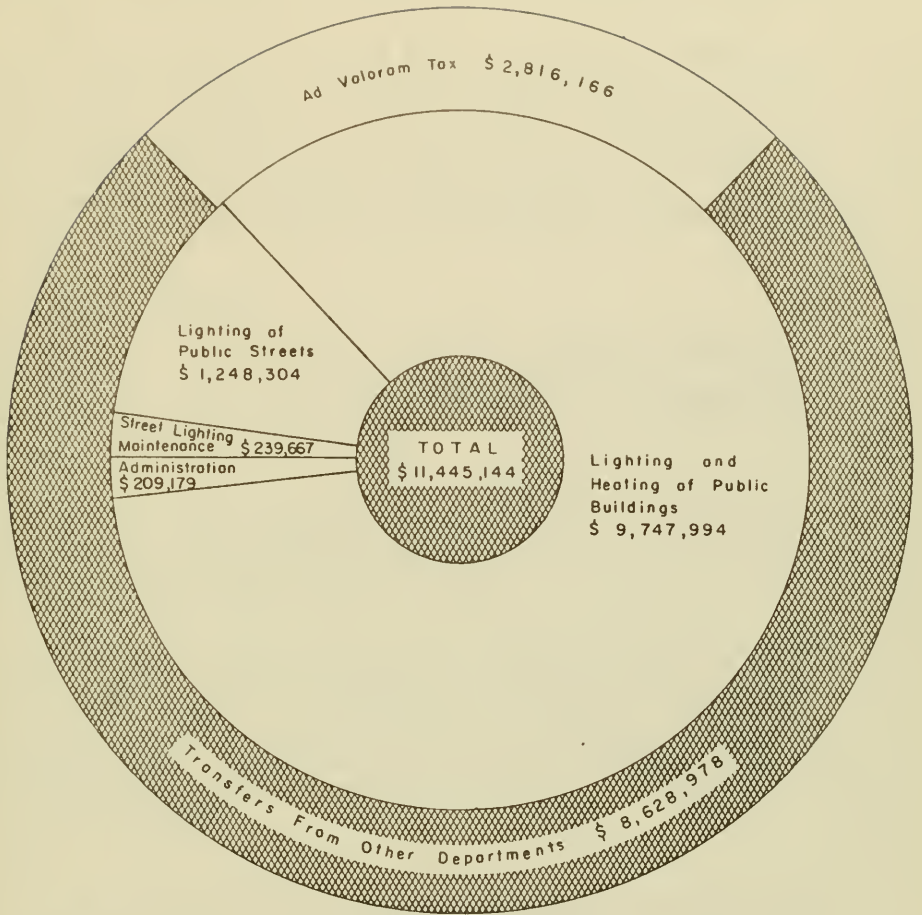
Maintenance and repair of City-owned installations was performed under two contracts. One provided for group replacement of lamps in accordance with schedules developed by the Bureau. A second contract covered work required for repair of damages and defective equipment, painting and miscellaneous maintenance.

Under contract, the Pacific Gas and Electric Company furnished street lighting service as directed, including the furnishing, maintenance and operation of Company-owned facilities. Certain services were provided also for City-owned facilities, including switching and control, replacement of individual lamps and globes, and emergency work required during other than normal working hours.

Electric energy for all City and Company-owned streetlight operation was supplied by the Hetch Hetchy power system.

NEW STREETLIGHTS ON
BOSWORTH STREET





BUREAU OF LIGHT, HEAT & POWER
 REVENUES AND EXPENDITURES
 FISCAL YEAR 1976-1977

Engineering

The Bureau reviews, recommends changes, approvals or rejections of, and correlates all street lighting installations, including that done by the Department of Public Works, the Pacific Gas and Electric Company, the State of California, subdividers, etc.

During the fiscal year 1976-77, 14 street lighting contracts, involving a total of 664 new streetlights, were approved by the Public Utilities Commission. Plans were submitted for approval only after careful checking to determine that illumination will exceed the minimum requirements established by the American National Standards Institute; and that all materials used, and manner of installation, meet with the applicable local, state and federal rules, regulations and statutes governing the installation of electrical works.

Operation and Maintenance

As of June 30, 1977, a total of 37,446 City-owned and Company-owned streetlights were in service to the public streets, parks, viaducts, overcrossings, tunnels and underpasses. A summary of the number and type of units in service, at the end of the fiscal year, is shown in Appendix Table 14.

A total of \$1,524,286 was expended for operation, maintenance, and repair of the street lighting system. Of the total cost, \$18,773 was paid by the State for its share of the operation and maintenance of street lighting at intersections on City streets, which are part of the State Highway system.

During the fiscal year, there were 127 accidents involving damage to City-owned street lighting property. Investigation was made, as soon as possible, to remove hazards to the public and obstructions to traffic. Total cost of repairs to damaged City-owned street lighting property was \$104,000. Every effort was made to secure reimbursement for damages incurred from responsible parties. Previous experience indicates that more than half of the repair costs will be recovered.

Complaints

During the year, 40 complaints requiring field investigation were received and acted upon. These complaints concerned inadequate illumination, objectionable glare in windows, and requests for temporary and permanent relocation of street lighting poles.

Improvements

During the fiscal year 1976-77, a total of 691 new City-owned streetlights were placed in service at a cost of \$1,184,878. Improvements were financed by State Gasoline Tax and the 1964 and 1972 Street Lighting Bond Issue as indicated in Appendix Tables 16 and 17.

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UTILITY SERVICES TO MUNICIPAL DEPARTMENTS

General

Electric energy supplied to municipal departments is generated on the Hetch Hetchy power system and delivered to various service points by transmission and distribution facilities of Pacific Gas and Electric Company under a wheeling contract. Natural gas supplied to municipal departments is furnished by the Pacific Gas and Electric Company under a service contract.

Municipal Consumption of Electricity and Gas

During the fiscal year, 496,305,458 kilowatthours of electrical energy were consumed through 1,072 municipal accounts at an expenditure of \$6,966,586. Of the above, 152,161,432 kilowatt-hours of energy were supplied to the San Francisco International Airport for resale to tenants. Natural gas consumption was 17,174,388 therms through 560 accounts at a cost of \$3,321,758.

There were several increases in gas rates last year which increased the cost to municipal accounts by approximately \$629,868. The average cost per therm increased by approximately 28 percent.

A summary of consumption and expenditures for these commodities is shown in Tables 12 and 13.

PEOPLE
AT
WORK



HOWARD P. GRANT



JACK O'ROURKE



JOE F. DE GRACA



EVERETT M. HINTZE & KEVIN R. WALSH

A P P E N D I X



HETCH HETCHY RESERVOIR

Hetch Hetchy Reservoir, which provides a water supply for almost 2,000,000 people in the Bay Area, is shown here at its lowest point during the drought...at 6.8 percent of capacity.

CONTENTS OF APPENDIX

Table 1	Summary of Receipts, Expenditures and Taxes
Table 2	Comparison of Budgeted and Actual Expenditures
Table 3	Motive Power Section - Substations
Table 4	TRANSIT POWER DIVISION - Comparison of Budgeted and Actual Expenditures
Table 5	Construction Contracts
Table 6	Precipitation, Runoff, Storage and Delivery
Table 7	Electric Energy Generated, Purchased, and Distributed
Table 8	Comparative Electric Energy Sales to Customers
Table 9	Comparative Gross Revenue Received From Sale of Electric Energy
Table 10	Electric Energy Generated, Purchased, and Distributed By Fiscal Years
Table 11	Comparison of Budgeted and Actual Expenditures and Receipts
Table 12	Expenditure for Electricity for Municipal Purposes
Table 13	Expenditure for Gas for Municipal Purposes
Table 14	Streetlights in Service
Table 15	Expenditures for Operation and Maintenance of Street Lighting
Table 16	New City-Owned Street Lighting Installations
Table 17	Historical Cost of City-Owned Street Lighting Improvements

TABLE 1

HETCH HETCHY WATER AND POWER

SUMMARY OF RECEIPTS, EXPENDITURES AND TAXES

FISCAL YEAR 1976-77

<u>RECEIPTS</u>	<u>Budget</u>	<u>Actual</u>	<u>-Under, Over</u>
Revenue from Sale of Electrical Energy	\$ 40,933,000	\$ 43,341,973	\$ 2,408,973
Revenue from Sale of Water and Standby Charge, SFWD	8,000,000	8,000,000	
Other Revenue	<u>100,000</u>	<u>124,451</u>	<u>\$ 24,451</u>
Total Revenue	<u>\$ 49,033,000</u>	<u>\$ 51,466,424</u>	<u>\$ 2,433,424</u>
<u>EXPENDITURES</u>			
Total Expenditures	<u>\$ 56,670,959</u>	<u>\$ 55,970,922</u>	<u>\$ -700,037</u>
<u>TAXES</u>			
<u>Tax Levying Entity</u>	<u>No. of Bills</u>	<u>Assessed Values</u>	<u>Total Amount of Taxes</u>
Alameda County	10	\$ 2,450.00	\$ 292.76
San Joaquin County	12	45,375.00	4,481.18
San Mateo County	16	3,900.00	361.36
Stanislaus County	79	124,310.00	12,602.74
Tuolumne County	42	6,105,311.00	559,936.46
Banta-Carbona Irrigation Dist.	1	3,642.28	156.62
Oakdale Irrigation Dist.	4	25,897.00	535.94
West Stanislaus Irrigation Dist.	<u>1</u>	<u>4,250.00</u>	<u>153.00</u>
Total	<u>165</u>	<u>\$ 6,315,135.28</u>	<u>\$ 578,520.06</u>

TABLE 2
HETCH HETCHY WATER AND POWER*

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES (INCLUDING ENCUMBRANCES)
FISCAL YEAR 1976-77

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER, OVER</u>
110	Permanent Salaries	\$ 823,518	\$ 785,429	\$ -38,089
110-1	Permanent Salaries - Crafts	1,219,893	1,087,895	-131,998
111	Overtime	15,000	10,804	-4,196
11-1	Overtime - Crafts	121,539	73,888	-47,651
112	Holiday Pay	2,200	2,181	-19
112-1	Holiday Pay - Crafts	2,282	2,282	-
113	Extended Workweek	3,869	3,439	-430
113-1	Extended Workweek - Crafts	10,460	13,603	3,143
120	Temporary Salaries	55,000	30,441	-24,559
120-1	Temporary Salaries - Crafts	192,000	143,217	-48,783
139	Permanent Salaries - Gardeners	54,653	54,653	-
200	Contractual Services	101,745	94,218	-7,527
216	Maint. and Repair of Auto Equipment	10,209	8,422	-1,787
231-1	Purchase of Power for Resale	34,007,000	33,921,500	-85,500
231-2	Service Charge for Transm. and Dist.	2,515,000	2,568,255	53,255
251	Subsistence of Employees	4,000	1,944	-2,056
300	Materials and Supplies	192,202	232,597	40,395
640	Water Rights and Damage Claims	5,000	944	-4,056
641	Hydrography	49,800	47,909	-1,891
801	Accident Compensation	45,335	45,335	-
804	Claims	500	4,420	3,920
812	Fidelity Insurance	82	82	-
813	Automobile Insurance	10,599	10,599	-
814	Fire Insurance	8,297	26,439	18,142
815	Miscellaneous Insurance	39,007	39,007	-
853	Assessments	51,091	51,091	-
854	Membership Dues	300	366	66
855	Watershed Protection	20,000	20,000	-
855	Fee to U.S. Gov't - Raker Act	30,000	30,000	-
856	Maint. of Roads - Raker Act	15,000	15,000	-
860	Retirement Allowances	589,119	437,612	-151,507
862	Social Security	140,037	135,831	-4,206
865	Health Service System	77,872	71,665	-6,207
870	Taxes	578,520	578,520	-
880	Rental - Transm. Lines and Offices	116,400	114,733	-1,667
900	Services of Other Departments	982,047	969,176	-12,871
	TOTAL OPERATION AND MAINTENANCE	\$42,089,576	\$41,633,497	-456,079
400	Equipment	106,825	104,850	-1,975
500	Additions and Betterments	221,000	221,000	-
700	Reconstruction and Replacement	1,978,035	1,978,035	-
830	Bond Interest and Redemption	8,603,660	8,603,660	-
	TOTAL	\$52,999,096	\$52,541,042	-458,054

* Does not include Transit Power Division - Table 4 or Bureau of Light, Heat and Power - Table 11.

TABLE 3

TRANSIT POWER DIVISION

MOTIVE POWER SECTION - SUBSTATIONS

Substation	Type (a)	Date Installed	No. of Units	KW Size	Max. Load in KW	Fiscal Year 1976-77	
						KWH	Converted to 600 V dc
Bryant	M-G	1910	3	1500	2308	8,250,350	
	M-G	1910	(b) 2	1500	0	0	
Turk	M-G	1910	3	1500	4501	9,516,400	
	M-G	1910	(b) 2	1500	0	0	
Downtown	SC	1921	2	2000	3480	8,859,000	
	SC	1924	1	3000			
Eighth Avenue	SC	(c) 1921	1	1500	1406	3,292,000	
	SC	(c) 1921	(b) 1	1500	0	0	
	SC	1924	1	2000			
West Portal	SR	1951	1	2000	2375	6,634,000	
Outer Mission	MAR	1953	1	750	875	2,694,000	
Geneva	M-G	1910	3	1500	1395	19,400	
Civic Center	SR	1976	2	4000	825	1,209,600	
Church	SR	1977	2	4000	595	528,000	
Judah	SR	1977	1	4000	346	153,600	
						41,156,350	

Notes: (a) Type of Conversion Equipment: M-G = Motor-Generator
SC = Synchronous Converter
MAR = Mercury Arc Rectifier
SR = Silicon Rectifier

(b) Indicates units that are not serviceable. Units have not been repaired because of the high cost and because they are not needed to carry the present load. Also, it is planned to replace the conversion equipment with modern silicon rectifiers in the near future.

(c) Units were originally installed at Washington and Mason in 1914 and were moved to Eighth Avenue in 1921.

TABLE 4

HETCH HETCHY WATER AND POWER

TRANSIT POWER DIVISION

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1976-77

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER OVER</u>
110	Permanent Salaries	\$ 68,425	\$ 34,548	\$ -33,877
110-1	Permanent Salaries - Crafts	840,522	750,385	-90,137
111-1	Overtime - Crafts	91,398	99,651	8,253
112-1	Holiday Pay - Crafts	8,851	8,718	-133
113-1	Extended Work Week - Crafts	43,080	25,943	-17,137
120-1	Temporary Salaries - Crafts	8,000	9,071	1,071
200	Contractual Services	10,626	4,092	-6,534
300	Materials and Supplies	57,798	27,118	-30,680
800	Accident Compensation	20,665	20,665	
860	Retirement Allowances	266,830	199,471	-67,359
862	Social Security	48,672	47,205	-1,467
865	Health Service System	28,708	26,425	-2,283
900	Services of Other Departments	175,113	173,413	-1,700
	TOTAL OPERATION AND MAINTENANCE	\$ 1,668,688	\$ 1,426,705	\$ -241,983
400	Equipment	3,175	3,175	
700	Reconstruction and Replacements	2,000,000	2,000,000	
	TOTAL	<u>\$ 3,671,863</u>	<u>\$ 3,429,880</u>	<u>\$ -241,983</u>

TABLE 5
HETCH HETCHY WATER AND POWER

CONSTRUCTION CONTRACTS
FISCAL YEAR 1976-77

Contract No.	Description	Contractor	Contract Time Started	Contract Time Completed	Original Contract Price	Value of Work Done During Fiscal Year
HH-494	Replace, Repair and Paint Trolley Poles on Fulton, La Playa and Mission Streets	Mahoney Electric Co. Inc.	11-10-75	9-15-76	185,246	13,284
HH-503	Taraval Street, and 46th Avenue 20th Avenue to Vicente Street Underground Duct System	Peter Kiewit Sons' Co.	3-29-76	10-8-76	246,200	114,718
HH-517	K Line - Transit Power Facilities Street Lighting and Related Work	Amelco Electric	5-24-76	-	132,865	132,891
HH-521	Market Street Subway Electrification Embarcadero Station to Duboce Portal	Amelco Electric	7-14-75	-	1,077,000	97,680
HH-522	Civic Center, Church and Downtown Substations, Installation of Electrical Equipment	De Narde Construction Co.	10-6-75	-	652,990	291,159
HH-523	Judah Street, 20th to 48th Avenues Underground Power Facilities	L. K. Comstock & Co. Inc.	2-28-77	-	355,462	130,189
HH-524	K Line Streetcar Overhead System Conversion for Pantograph Operation	Amelco Electric	2-21-77	-	239,000	0
HH-525	Sutter Street, Presidio Avenue to Leavenworth Street Underground Duct System	R. Flatland Co.	1-26-76	9-7-76	372,835	8,450

TABLE 5 (Cont'd)

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
HH-526	McAllister Street, Divisadero Street to Leavenworth Street, Underground Duct System	R. Flatland Co.	6-1-76	11-24-76	248,430	203,760
HH-527	Asbury, Fillmore, Church, 18th and Other Streets, Underground Duct System	Lowrie Paving Co. Inc.	6-28-76	1-13-77	367,999	353,388
HH-528	Laguna Honda and Judah Substations Construct Buildings and Install Equipment	Herrero Brothers Inc.	3-29-76	-	567,913	298,109
HH-529	Carl Street Substation, Construct Building and Install Equipment	S. J. Amoroso Construction Co., Inc.	7-19-76	-	597,800	411,200
HH-531	Market Street Subway Electrification Duboce Junction to Eureka Station	Ameico Electric	6-26-77	-	195,428	174,519
HH-536	Streetcar Overhead System, West Portal Avenue, Conversion for Pantograph Operation and Related Street Lighting Work	Mahoney Electric Co., Inc.	11-8-76	-	295,671	138,773
HH-539	Van Ness Avenue, Market Street to North Point Street, Repair and Paint Trolley and Street Lighting Poles	Louis Khan Painting	7-6-76	2-25-77	39,893	39,893
HH-540	Sutter, McAllister and Fillmore Streets, Underground Power Facilities and Related Work	Abbett Electric Corporation	11-8-76	-	238,495	188,162

TABLE 5 (Cont'd)

Contract No.	Description	Contractor	Contract Time		Original Contract Price	Value of Work Done During Fiscal Year
			Started	Completed		
HH-541	Paint Steel Towers, Moccasin Newark Transmission Line	Frank Brown Painting Contractor	7-6-76	8-25-76	56,260	50,522
HH-543	Repair and Reroof Hetch Hetchy Buildings, Moccasin and Early Intake	Western Roofing Service	10-4-76	-	48,664	48,334
HH-544	Fillmore Substation, Construct Building and Install Equipment	Herrero Brothers, Inc.	9-13-76	-	651,840	541,220
HH-546	Randolph Substation, Construct Building and Install Equipment	Kaplan-Jones Joint Venture	3-3-77	-	226,900	83,371
HH-547	San Jose Substation, Install Equipment	L. K. Comstock & Co. Inc.	2-28-77	-	84,790	3,392
HH-548	Taraval Substation, Construct Building and Install Equipment	Joseph Di Giorgio & Sons, Inc.	4-18-77	-	253,950	23,457
HH-552	J, N, No. 22 and No. 33 Lines Underground Power Facilities and Related Work	Ameico Electric	5-23-77	-	238,950	6,445
HH-553	Replace, Repair and Paint Steel Trolley Poles on Mission Street	Mahoney Electric Co., Inc.	12-6-76	-	89,984	63,580
HH-554	Construction of No. 47 Trolley Coach Loop at Army Street	Mahoney Electric Co., Inc.	10-15-76	-	31,110	27,949
HH-555	Red Mountain Bar, Surge Shaft Cover	National Bridge Co.	6-13-77	-	23,800	0

TABLE 5 (Cont'd)

<u>Contract No.</u>	<u>Description</u>	<u>Contractor</u>	<u>Contract Time Started</u>	<u>Contract Time Completed</u>	<u>Original Contract Price</u>	<u>Value of Work Done During Fiscal Year</u>
HH-556	Construction of Claribel Lateral Timber Bridge	H. Max Lee, Inc.	6-26-76	10-23-76	4,990	4,990
HH-557	Paint Steel Trolley Poles, Various Locations	Giampolini and Co.	3-27-77	-	37,200	13,307
HH-559	Howard and Folsom Streets, Eleventh Street to Main Street, Underground Duct System	McGuire and Hester	9-28-77	-	629,735	379,375
HH-560	Haight Street, Stanyan to Gough Underground Duct System	Underground Construction Co., Inc.	5-2-77	-	329,847	110,632
HH-561	Fillmore, Jackson, Presidio and Other Streets, Underground Duct System	W. R. Thomason, Inc.	1-31-77	-	614,000	518,868
HH-563	Folsom Street, 11th to 16th and Eleventh Street, Mission to Bryant Underground Duct System	Underground Construction Co., Inc.	12-13-76	4-14-77	169,075	160,400
HH-564	Moccasin and Tesla Portal Buildings Exterior Repair, Painting and Roof Preservative	Ross F. Porter	12-13-76	-	50,400	54,846
HH-565	Lower Cherry Aqueduct Rehabilitation	Chas. I. Cunningham Co.	9-7-76	10-30-76	65,933	<u>54,083</u>
	Total Amount of Hetch Hetchy Contract Work Performed During Fiscal Year					\$4,740,946

TABLE 6
HETCH HETCHY WATER SUPPLY

SEASON PRECIPITATION (INCHES)	PRECIPITATION, RUNOFF, STORAGE AND DELIVERY AS OF JUNE 30 BY FISCAL YEARS					
	Normal	1972-73	1973-74	1974-75	1975-76	1976-77
Hetch Hetchy	34.27	35.97	38.46	39.15	21.80	18.53
Lake Lloyd	46.92	46.03	57.45	47.86	24.91	21.10
Approx. Percent of Normal	100%	102%	112%	107%	58%	50%
<u>WATERSHED RUNOFF (ACRE-FT.) (a)</u>						
Hetch Hetchy	726,098	780,799	871,240	769,239	376,347	210,851
Lake Lloyd)	424,759	444,358	533,923	450,131	229,041	123,372
Lake Eleanor)						
Total	1,150,857	1,225,157	1,405,163	1,219,370	605,388	334,223
Approx. Percent of Normal		106%	121%	105%	52%	29%
<u>RESERVOIR STORAGE (ACRE-FT.) (a)</u>						
	No Spill					
	Capacity					
Hetch Hetchy	360,360	362,736	360,163	327,963	201,576	154,040
Lake Lloyd	268,800	217,872	268,284	239,909	154,439	135,507
Lake Eleanor	27,100	27,016	26,726	26,823	2,563	1,043
Total	656,260	607,624	655,173	594,695	358,578	290,590
<u>DELIVERY TO SFWD (ACRE-FT.) (a) (b) (c)</u>						
Average per day		585	532	675	588	747
Maximum per day		856	850	925	934	944
Total for fiscal year		213,684	193,518	246,514	215,726	273,450

NOTES: (a) One acre-foot equals 325,900 gallons or approximately 1/3 million gallons.
 (b) Includes delivery to Livermore site, U.S. Atomic Energy Commission.
 (c) Total since operation of Hetch Hetchy Aqueduct began in 1934: 5,074,170 acre-feet.

TABLE 7
HETCH HETCHY POWER SYSTEM

ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED
FISCAL YEAR 1976-77

<u>PLANT DATA</u>	<u>Nameplate Rating (Kilowatts)</u>	<u>Capability (Kilowatts)</u>	<u>Annual Plant Factor - %</u>
Moccasin Powerhouse	90,000	104,000	41.9
Dion R. Holm Powerhouse	135,000	150,000	11.5
Robert C. Kirkwood Powerhouse	67,500	85,000	41.3
Total	<u>292,500</u>	<u>339,000</u>	
 <u>ENERGY GENERATED AND PURCHASED (KILOWATT-HOURS)</u>			
<u>Gross Generation</u>			
Moccasin Powerhouse		330,510,000	
Dion R. Holm Powerhouse		135,416,000	
Robert C. Kirkwood Powerhouse		<u>244,076,000</u>	710,002,000
 <u>Station Service</u>			
Moccasin Powerhouse		853,800	
Dion R. Holm Powerhouse		499,290	
Robert C. Kirkwood Powerhouse		<u>451,590</u>	<u>1,804,680</u>
 <u>Net Generation</u>			
			708,197,320
 <u>Supplementary Energy</u>			
"Bank" Withdrawal*		0	
Purchase (PGandE)		<u>1,468,919,029</u>	<u>1,468,919,029</u>
 <u>Total</u>			
			<u><u>2,177,116,349</u></u>
 <u>ENERGY DISTRIBUTED (KILOWATT-HOURS)</u>			
<u>Sales</u>			
Municipal Accounts		499,833,145	
Modesto Irrigation District		1,013,509,726	
Turlock Irrigation District		591,956,719	
Kaiser Cement and Gypsum Corp.		0	
Kaiser Aluminum and Chemical Corp.		0	
Norris Industries, Inc.		2,058,278	
Lockheed Missiles and Space Co. Inc.		0	
General Motors Corporation		0	
I B M Corporation		0	
Liquid Air, Inc.		0	
Miscellaneous Customers		<u>824,292</u>	2,108,182,160
 <u>Non-Revenue</u>			
Project Use		2,965,669	
"Bank" Deposit*		<u>0</u>	2,965,669
 <u>Losses</u>			
Hetch Hetchy System		36,002,634	
PGandE System (Municipal Accounts)		<u>29,965,886</u>	<u>65,968,520</u>
 <u>Total</u>			
			<u><u>2,177,116,349</u></u>

* In accordance with letter-agreement between City and PGandE dated 6/24/75

TABLE 8

HETCH HETCHY POWER SYSTEM

COMPARATIVE ELECTRIC ENERGY SALES TO CUSTOMERS
FISCAL YEARS 1975-76 AND 1976-77
 (Nearest 100,000 Kilowatthours)

<u>CUSTOMER</u>	<u>1975-76</u>	<u>1976-77</u>
Municipal Accounts		
International Airport	189,200,000	195,200,000
Municipal Railway	56,900,000	62,300,000
Public Works	26,800,000	26,000,000
Street Lighting	46,400,000	46,000,000
Unified School District	39,700,000	39,100,000
Water Department	48,400,000	44,900,000
Other City Departments	82,800,000	86,300,000
Modesto Irrigation District	865,100,000	1,013,500,000
Turlock Irrigation District	248,800,000	592,000,000
Kaiser Cement and Gypsum Corp.	78,400,000	0
Kaiser Aluminum and Chemical Corp.	11,300,000	0
Norris Industries, Inc.	7,200,000	2,100,000
Lockheed Missiles & Space Co., Inc.	80,200,000	0
General Motors Corporation	28,800,000	0
I B M Corporation	25,800,000	0
Liquid Air, Inc.	12,500,000	0
Miscellaneous Customers	900,000	800,000
TOTAL	<u>1,849,200,000</u>	<u>2,108,200,000</u>

TABLE 9

HETCH HETCHY POWER SYSTEM

COMPARATIVE GROSS REVENUE RECEIVED FROM SALE OF ELECTRIC ENERGY
FISCAL YEARS 1975-76 AND 1976-77
 (Nearest \$1,000)

<u>CUSTOMER</u>	<u>1975-76</u>	<u>1976-77</u>
Municipal Accounts		
International Airport	\$ 2,542,000	\$ 3,081,000
Municipal Railway	649,000	781,000
Public Works	330,000	359,000
Street Lighting	517,000	559,000
Unified School District	553,000	612,000
Water Department	476,000	509,000
Other City Departments	1,011,000	1,126,000
Modesto Irrigation District	7,457,000	20,982,000*
Turlock Irrigation District	2,283,000	12,484,000*
Kaiser Cement and Gypsum Corp.	1,318,000	124,000
Kaiser Aluminum and Chemical Corp.	220,000	35,000
Norris Industries, Inc.	164,000	32,000*
Lockheed Missiles & Space Co., Inc.	1,454,000	134,000
General Motors Corporation	572,000	37,000
I B M Corporation	478,000	60,000
Liquid Air, Inc.	190,000	17,000
Miscellaneous Customers	10,000	10,000
	<u>\$ 20,224,000</u>	<u>\$ 40,942,000</u>
TOTAL		

* Indicates amount as paid by customer

TABLE 10

HETCH HETCHY POWER SYSTEM
ELECTRIC ENERGY GENERATED, PURCHASED, AND DISTRIBUTED BY FISCAL YEARS --- KILOWATT-HOURS

	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77
<u>NET GENERATION</u>						
Nocasin Powerhouse	533,978,200	542,886,200	554,418,600	539,122,000	459,718,300	329,656,200
Dion R. Holm Powerhouse	808,515,430	653,141,570	818,867,290	875,047,560	655,980,250	134,916,710
Robert C. Kirkwood Powerhouse	614,151,930	601,147,890	616,788,400	640,097,630	522,119,850	243,624,410
Subtotal	1,956,645,560	1,797,175,660	1,990,074,290	2,054,267,190	1,637,818,400	708,197,320
<u>SUPPLEMENTAL ENERGY</u>						
"Bank" Withdrawals*	46,360,466	0	36,435,281	123,458,969	36,545,220	0
Purchase (PG&E)	108,734,434	351,288,448	44,401,773	0	247,922,311	1,468,919,022
Subtotal	155,094,900	351,288,448	80,837,054	123,458,969	284,467,531	1,468,919,022
TOTAL	2,111,740,460	2,148,464,108	2,070,911,344	2,177,726,159	1,922,285,931	2,177,116,342
<u>DISTRIBUTION</u>						
Sales						
Municipal Accounts	478,105,789	508,259,909	482,482,697	481,275,895	490,203,242	499,833,142
Modesto Irrigation Dist.	796,740,000	858,816,000	787,392,000	734,880,000	865,104,000	1,013,509,719
Turlock Irrigation Dist.	360,619,200	421,484,000	302,784,000	219,120,000	248,817,883	591,956,719
Kaiser Cement & Gypsum	152,127,205	145,368,000	156,720,000	143,688,000	78,351,659	0
Kaiser Aluminum & Chemical	33,996,000	31,521,600	31,320,000	28,137,600	11,280,000	0
Norris Industries, Inc.	17,664,768	22,325,760	22,502,016	21,695,155	7,167,744	2,058,278
Hercules, Inc.	57,906,000	---	---	---	---	---
California Ammonia Co.	80,876,760	---	---	---	---	---
Air Products & Chemicals	---	---	---	---	---	---
Valley Nitrogen Producers	---	---	---	---	---	---
Lockheed Missiles	---	---	---	---	---	---
General Motors	---	---	39,556,800	209,304,000	80,177,458	0
IBM Corporation	---	---	---	75,978,000	28,837,778	0
Liquid Air, Inc.	---	---	---	82,047,387	25,761,600	0
Miscellaneous Customers	759,065	847,858	733,633	28,139,425	12,547,200	824,292
Non-Revenue				809,002	920,851	
Project Use	4,287,512	4,003,796	3,266,691	3,264,541	3,277,963	2,965,669
"Bank Deposit"*	9,756,928	28,985,698	130,908,552	33,771,707	2,773,513	0
Losses	118,901,233	126,851,487	113,244,955	115,615,447	67,065,040	65,968,520
TOTAL	2,111,740,460	2,148,464,108	2,070,911,344	2,177,726,159	1,922,285,931	2,177,116,342

* In accordance with letter-agreement between City and PG&E dated June 24, 1975.

TABLE 11
BUREAU OF LIGHT, HEAT AND POWER

COMPARISON OF BUDGETED AND ACTUAL EXPENDITURES AND RECEIPTS
(INCLUDING ENCUMBRANCES)

FISCAL YEAR 1976-77

<u>OE</u>	<u>DESCRIPTION</u>	<u>BUDGET</u>	<u>ACTUAL</u>	<u>-UNDER</u> <u>+OVER</u>
<u>EXPENDITURES</u>				
110	Permanent Salaries	\$ 181,225	\$ 153,913	\$ -27,312
111	Overtime	538	538	0
112	Holiday Pay	537	0	-537
200	Contractual Services	1,284	1,338	+54
231	Lighting and Heating of Public Buildings - General	2,372,380	2,617,266	+244,886
231-1	Lighting and Heating of Public Buildings - Special Fund	7,440,009	7,130,728	-309,281
231-2	Lighting of Public Streets - Pacific Gas and Electric Co.	695,380	706,554	+11,174
231-3	Lighting of Public Streets - Hetch Hetchy	507,620	540,350	+32,730
231-4	Lighting of Public Streets - Calif. Division of Highways	1,400	1,400	0
300	Materials and Supplies	500	499	-1
400	Equipment	1,700	1,507	-193
813	Auto Insurance	257	257	0
860	Retirement Allowance	33,408	28,459	-4,949
862	Social Security	8,205	5,757	-2,448
865	Health Service System	6,407	4,911	-1,496
954	EDP - PUC Data Processing	12,000	12,000	0
TOTAL		<u>\$11,262,850</u>	<u>\$11,205,477</u>	<u>\$ -57,373</u>

RECEIPTS

Interfund Receipts*	\$ 8,718,076	\$ 8,389,311	\$-328,765
Ad Valorem Taxes	<u>2,544,774</u>	<u>2,816,166</u>	<u>+271,392</u>
TOTAL	<u>\$11,262,850</u>	<u>\$11,205,477</u>	<u>\$ -57,373</u>

WORK ORDER APPROPRIATIONS FROM ROAD FUND

<u>DESCRIPTION</u>	<u>TOTAL FUNDS</u>	<u>EXPENDITURE</u>	<u>-UNDER</u> <u>+OVER</u>
Maintenance and Repair of Street Lighting Installations	\$ 238,372	\$ 239,667	\$ +1,295

* Transfers from other Departments.

TABLE 12
BUREAU OF LIGHT, HEAT AND POWER
EXPENDITURE FOR ELECTRICITY FOR MUNICIPAL PURPOSES
FISCAL YEAR 1976-77

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION KILOWATT-HOUR</u>	<u>EXPENDITURES</u>
Art Commission (a)	3	38,320	792
Art Museum	2	1,248,640	15,938
Auditorium and Brooks Hall	1	4,917,000	66,933
Child Care Centers	12	268,067	5,391
City Demonstration Agency	1	170,720	2,925
City Planning	1	80,660	1,440
De Young Museum	1	3,059,200	36,573
Disaster Corp.	1	117	1,711
Electricity	5	844,218	11,051
Farmer's Market	1	25,706	520
Fire	59	2,993,742	54,644
Hassler Health Home	1	133,000	2,375
Health	43	29,520,323	299,786
Hetch Hetchy	6	128,975	2,728
Hidden Valley Ranch	1	827,040	11,485
International Airport (b)	18	195,244,022	3,081,124
Junior College District	26	7,746,837	100,695
Juvenile Hall	3	1,397,914	16,825
Legion of Honor	1	533,600	7,839
Library	31	2,444,828	39,228
Log Cabin Ranch	13	307,759	6,427
Municipal Railway	75	62,282,949	780,500
Parking Authority	18	179,171	3,672
Police	15	828,646	14,904
Public Buildings	14	15,301,621	168,256
Public Works	111	25,712,986	353,696
Purchasing	5	533,334	7,697
Real Estate	5	245,248	5,341
Recreation and Park	208	9,997,703	167,708
Recreation and Park - Candlestick Park	3	2,078,538	66,212
Recreation and Park - Yacht Harbor	32	1,153,833	21,859
Sheriff	3	1,429,560	16,374
Social Services	5	854,272	11,812
Street Lighting Operations (.003)	1	45,976,235	540,350
Unified School District	219	31,373,067	510,535
War Memorial	2	1,525,360	22,057
Water	126	44,882,247	509,183
TOTAL MUNICIPAL DEPARTMENTS	1,072	496,305,458	6,966,586
Academy of Sciences	2	3,212,291	36,343
State of California: Street Lighting	1	(c)	18,773
Traffic Devices	1	315,396	5,596
GRAND TOTAL FROM HETCH HETCHY	1,076	499,833,145	7,027,298

Notes: (a) New Account.

(b) Including 152,161,432 KWH resold at commercial rates for \$2,682,816 to Airport tenants.

(c) Included under Street Lighting Operations.

TABLE 13

BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURE FOR GAS FOR MUNICIPAL PURPOSES

FISCAL YEAR 1976-1977

NATURAL GAS

<u>DEPARTMENT</u>	<u>NO. OF ACCOUNTS</u>	<u>CONSUMPTION THERMS</u>	<u>EXPENDITURES</u>
Art Commission (a)	2	3,398	680
Auditorium and Brooks Hall	2	1,007	197
Child Care Centers	11	30,156	5,723
City Demonstration Agency	1	9,539	1,878
City Planning	1	4,551	883
De Young Museum	1	238,287	46,149
Electricity	2	38,560	7,566
Farmer's Market	1	335	70
Fire	54	441,321	85,108
Hassler Health Home	3	1,443	293
Health	34	6,011,678	1,141,123
Hetch Hetchy	2	1,730	341
International Airport	5	1,444,270	278,861
Junior College District	17	606,221	116,916
Juvenile Hall	4	404,798	78,562
Legion of Honor	1	49,483	9,685
Library	28	93,808	18,256
Municipal Railway	14	264,005	54,733
Police	11	40,994	7,925
Public Buildings	5	1,233,393	239,823
Public Works	15	284,860	59,913
Purchasing	3	42,173	8,242
Real Estate	3	4,203	762
Recreation and Park	105	1,118,168	216,320
Recreation and Park - Candlestick Park	1	94,716	18,366
Registrar of Voters	1	2,934	557
Sheriff	3	438,175	84,274
Single Men's Rehabilitation	1	15,179	2,758
Social Services	4	48,849	9,532
Unified School District	211	3,832,147	752,904
War Memorial	3	235,392	46,277
Water	<u>11</u>	<u>138,615</u>	<u>27,081</u>
TOTAL MUNICIPAL DEPARTMENTS	560	17,174,388	3,321,758

Note: (a) New Account

TABLE 14
BUREAU OF LIGHT, HEAT AND POWER
STREETLIGHTS IN SERVICE
JUNE 30, 1977

<u>SIZE & TYPE OF LAMP</u>	<u>COMPANY-</u> <u>OWNED</u>	<u>JOINTLY-</u> <u>OWNED</u>	<u>CITY-</u> <u>OWNED</u>	<u>TOTAL</u>
<u>UNDERGROUND CONNECTION</u>				
<u>High Voltage Series Circuit</u>				
1,000-Lumen Incandescent	---	22	---	22
2,500-Lumen Incandescent	245	24	62	331
4,000-Lumen Incandescent	937	122	1,065	2,124
6,000-Lumen Incandescent	571	449	2,455	3,475
10,000-Lumen Incandescent	430	17	515	962
400-Watt Mercury Vapor	6	43	232	281
175-Watt Mercury Vapor	---	---	4	4
250-Watt Mercury Vapor	2	---	79	81
<u>Low Voltage Multiple Circuit</u>				
1,000-Lumen Incandescent	---	---	60	60
2,500-Lumen Incandescent	10	4	54	68
4,000-Lumen Incandescent	142	5	109	256
6,000-Lumen Incandescent	34	5	84	123
10,000-Lumen Incandescent	10	---	14	24
5,500-Lumen Fluorescent	---	---	38	38
23,000-Lumen Fluorescent	38	---	4	42
100-Watt Mercury Vapor	---	---	111	111
175-Watt Mercury Vapor	45	---	3,783	3,828
250-Watt Mercury Vapor	34	---	1,641	1,675
400-Watt Mercury Vapor	304	---	4,660	4,964
700-Watt Mercury Vapor	---	---	369	369
1,000-Watt Mercury Vapor	---	---	100	100
250-Watt Sodium Vapor	---	---	309	309
400-Watt Sodium Vapor	---	---	658	658
<u>OVERHEAD CONNECTION</u>				
<u>High Voltage Series Circuit</u>				
2,500-Lumen Incandescent	1	---	---	1
4,000-Lumen Incandescent	14	---	---	14
<u>Low Voltage Multiple Circuit</u>				
2,500-Lumen Incandescent	2	---	---	2
4,000-Lumen Incandescent	58	---	49	107
6,000-Lumen Incandescent	8	---	---	8
175-Watt Mercury Vapor	14,697	---	2	14,699
250-Watt Mercury Vapor	1,908	---	---	1,908
400-Watt Mercury Vapor	802	---	---	802
TOTAL, JUNE 30, 1977	<u>20,298</u> 54.2%	<u>691</u> 1.8%	<u>16,457</u> 44.0%	<u>37,446</u> 100%
TOTAL, JUNE 30, 1976	20,429	692	16,257	37,378
NET CHANGE DURING THE YEAR	131	1	200	68

TABLE 15
BUREAU OF LIGHT, HEAT AND POWER

EXPENDITURES FOR OPERATION AND MAINTENANCE OF STREET LIGHTING
FISCAL YEAR 1976 - 77

CONTRACTUAL SERVICE

P. G. & E. Company

Company-owned facilities (a)	883,566		
Jointly-owned facilities (a)	30,875		
City-owned facilities (b)	<u>105,038</u>	1,019,479	
Less deduction for energy component		312,925	706,554
Emergency service to City-owned facilities			5,946

Lease-Lite Corporation

Group lamp replacement - City-owned facilities			58,485
--	--	--	--------

Lease-Lite Corporation

Maintenance and repair - City-owned facilities			
Routine maintenance	50,130		
Repair of damage caused by accidents (c)	53,392		
Repair of damage caused by equipment failure	44,857		
Repair of damage caused by vandals	<u>2,615</u>		150,994

MATERIAL AND SUPPLIES (FURNISHED BY CITY)

Damage caused by accidents (c)	37,713		
Damage caused by equipment failure	14,495		
Damage caused by vandals	<u>2,160</u>		54,368

ELECTRIC ENERGY (HETCH HETCHY)

45,976,235/KWH at \$0.02408/KWH less 48.6% discount			569,053
---	--	--	---------

TOTAL EXPENDITURE 1,545,400

LESS AMOUNT PAID TO HETCH HETCHY FROM:

Gas Tax Funds for State Highway Routes	18,773		
Recreation and Park Department for off-street lighting	2,341		21,114

TOTAL NET EXPENDITURE 1,524,286

AVERAGE OPERATING COST

Based on number of lights in service June 30, 1977, average total cost of operation, maintenance and repair per light per year: 40.71

- NOTES: (a) Includes maintenance, repair, fixed charges and electric energy for Company-owned facilities.
- (b) Includes replacement of individual lamp and broken glassware, service and switching charges, and electric energy.
- (c) When responsible party is known, claim is filed for recovery of cost.

TABLE 16
BUREAU OF LIGHT, HEAT AND POWER

NEW CITY-OWNED STREET LIGHTING INSTALLATIONS
COMPLETED DURING FISCAL YEAR 1976-77

<u>Locations</u>	<u>Number of Lights</u>	<u>Type of Lights*</u>	<u>Value</u>
Financed by Bond Issues:			
Trumbull St. - Mission to Alemany St.	11	MV	\$ 22,001
Fillmore - Chestnut	58	MV	77,968
Bayshore Blvd. - Costa St. to County Line	27	MV	
	140	SV	286,520
Fillmore - Sutter	54	MV	65,401
Maiden Lane - Grant Ave. to Kearny St.	4	MV	6,132
Outer Richmond and Sunset Area	125	MV	284,133
Potrero Ave. - Division to Army	119	MV	118,881
Valencia St. - Market to Mission	142	MV	293,066
Eugenia Ave. Stairway, Prospect Ave. to Winfield St.	<u>2</u>	MV	<u>6,944</u>
Total	682		\$1,161,045
Financed by State Gasoline Tax:			
John Muir Drive	5	MV	\$ 17,310
Newhall and Mendall Sts.	<u>4</u>	MV	<u>6,523</u>
Total	9		\$ 23,833
Grand Total	691		\$1,184,878

*MV - Mercury Vapor
SV - Sodium Vapor (High Pressure)

TABLE 17
BUREAU OF LIGHT, HEAT AND POWER

HISTORICAL COST OF CITY-OWNED STREET LIGHTING IMPROVEMENTS

Fiscal Year	Ad Valorem Taxes	Gasoline Taxes	Street Lighting Bonds	Property Owners	State Highway Dept.	Miscellaneous Sources*
Prior to July 1, 1953	\$1,748,675	\$ 617,115	-	\$576,404	\$ 22,650	\$477,651
1953-54	142,151	22,181	-	23,495	2,274	1,239
1954-55	155,727	30,817	-	748	16,578	543
1955-56	15,704	48,620	-	2,484	19,181	1,360
1956-57	114,168	26,641	-	7,256	-	3,003
1957-58	2,501	64,942	-	18,199	4,142	-
1958-59	-	171,367	-	10,231	626	538
1959-60	-	100,126	-	35,874	10,242	4,083
1960-61	-	82,074	-	19,236	-	1,865
1961-62	-	200,113	-	116,376	24,550	7,994
1962-62	-	84,328	-	21,700	-	-
1963-64	-	340,108	-	32,556	6,000	378,664
1964-65	-	97,846	-	8,975	50,857	157,678
1965-66	-	474,673	\$ 522,899	-	-	997,572
1966-67	-	111,164	188,312	5,000	-	304,476
1967-68	-	175,949	331,941	-	-	507,890
1968-69	-	374,229	616,722	-	40,250	1,031,201
1969-70	-	359,635	261,000	-	-	620,635
1970-71	-	490,031	1,550,442	-	-	2,040,473
1971-72	-	541,534	1,810,011	-	-	2,351,545
1972-73	-	451,614	-	-	-	451,614
1973-74	-	266,764	236,314	-	-	503,078
1974-75	-	297,318	123,115	-	-	420,433
1975-76	-	347,876	376,928	-	-	724,798
1976-77	-	23,833	1,161,045	-	-	1,184,878
Totals	\$2,178,926	\$5,764,892	\$7,178,729	\$878,534	\$197,350	\$498,275
Less: Cost of portions removed prior to fiscal year 1975-76						\$1,919,424
Cost of portions removed during fiscal year 1976-77						122,275

Original cost of City-owned facilities in service on June 30, 1977

\$ 3,442,495
191,340
204,413
87,349
151,068
89,784
182,762
150,325
103,175
349,032
106,028
378,664
157,678
997,572
304,476
507,890
1,031,201
620,635
2,040,473
2,351,545
451,614
503,078
420,433
724,798
\$16,696,706

\$ 2,041,699
\$14,655,007

* Includes WPA and PWA (1935-1942). Boulevard Construction (1932-1934) Municipal Railway, Recreation and Park Department and Housing

1

