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CITY OF SACRAMENTO

DIVISION OF WATER AND SEWERS

927 - 10TH ST.
SUITE #201

SACRAMENTO, CALIFORNIA 95814 -2796
TELEPHONE (916) 449-5271

CITY MANAGER'S OFFICE
RECEIVED
DEC 8 1981

~~ROBERT W. JOHNSTON~~
MANAGER
ROBERT W. JOHNSTON
ASSISTANT MANAGER

December 8, 1981

City Council
Sacramento, CA

APPROVED
BY THE CITY COUNCIL

DEC 22 1981

OFFICE OF THE
CITY CLERK

AG 81087

Honorable Members in Session:

SUBJECT: Engineering Services for Development of a
Computerized Water Distribution System Model

SUMMARY

This report recommends approval of a resolution that would authorize the execution of an Engineering Services Agreement with James M. Montgomery, Consulting Engineers for the subject project. It further recommends that \$90,000 be transferred from the Water Fund to cover project expenditures.

BACKGROUND

The Division of Water & Sewers submitted a supplemental request for the FY 81-82 Capital Improvements Budget on June 30, 1981 to the Budget & Finance Committee. It included Item B-3 for Development of a Water Distribution System Analysis. The request was approved and forwarded to the City Council which also approved the request.

The purpose of the study is to develop a computerized model of the City's Water Distribution System. The model will be able to simulate the operation of the system under various conditions such as peak day or hour usage, fire conditions, water main failures, or new developments. The immediate use of the system will be in the sizing and location of new water transmission mains. The Division has a number of transmission mains scheduled over the next five years. The model will determine the most efficient size and alignment for the transmission main and assist in determining a priority rating from each. By doing this, it should be possible to experience savings in Capital Expenditures.

In the long term the model can be used for detail planning purposes. With the addition of a dynamic mode the model can also be used in analyzing energy usage at the water treatment plants. With electric rates projected at 20% per year increases for the next few years, the potential for savings is evident.

A number of firms were interviewed. James M. Montgomery, Consulting Engineers, Inc. were selected because they provided a detailed state of the art program. They also have extensive experience in modeling and have just completed a similar project in size and complexity for Las Vegas Valley Water District.

FINANCIAL DATA

The Supplemental Budget request indicates that specific requests for funds would be made when the project is awarded. Funds are available in the Water Fund and \$90,000 should be transferred to 4-13-3030-1523-4820.

RECOMMENDATIONS

It is recommended that the City Manager and the City Clerk be authorized to enter into an agreement with James M. Montgomery, Consulting Engineers, Inc. and amend the Water Distribution Capital Improvements Budget by passage of the attached resolution.

Respectfully submitted,

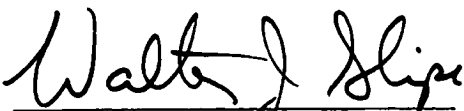


Robert W. Johnston
Acting Manager



R. H. Parker
City Engineer

Recommendation approved,



Walter J. Slize
City Manager

attachment

December 22, 1981
All Districts

RESOLUTION NO. 81-923

ADOPTED BY THE SACRAMENTO CITY COUNCIL ON DATE OF

A RESOLUTION AMENDING THE CITY BUDGET FOR
FY 1981-82 AND AUTHORIZING THE EXECUTION OF
AN AGREEMENT FOR DEVELOPMENT OF A COMPUTERIZED
WATER DISTRIBUTION SYSTEM MODEL

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF SACRAMENTO:

1. To provide additional funds for Development of a Computerized Water Distribution System Model and to authorize the execution of an Agreement for that work.
2. That the City Budget for FY 1981-82 is hereby amended by transferring \$90,000 from the Water Fund, 4-13, Unappropriated Fund Balance, to Water Distribution Capital Improvement Budget, 4-13-3030-1523-4820.
3. And that the City Manager and the City Clerk are hereby authorized to execute on behalf of the City of Sacramento an Engineering Services Agreement with James M. Montgomery, Consulting Engineers, Inc. for Development of a Computerized Water Distribution System Model.

MAYOR

ATTEST:

CITY CLERK

APPROVED
BY THE CITY COUNCIL

DEC 22 1981

OFFICE OF THE
CITY CLERK

CONSULTANT SERVICES AGREEMENT

APPROVED
BY THE CITY COUNCIL

DEC 23 1981

OFFICE OF THE
CITY CLERK

THIS AGREEMENT is made at Sacramento, California, as of

_____, 1981, by and between the CITY OF SACRAMENTO, a municipal corporation (hereafter "City"), and James M. Montgomery, Consulting Engineers, Inc., a California Corporation (hereafter "Consultant"), who agree as follows:

1. Services. Subject to the terms and conditions set forth in this Agreement, Consultant shall provide to City the services described in Exhibit "A". Consultant shall provide said services at the time, place, and in the manner specified in Exhibit "A". The Consultant shall not be compensated for services outside the scope of Exhibit "A" unless prior to the commencement of such services: (a) Consultant notifies the City that such service is deemed an additional service and Consultant estimates the additional compensation required for this activity; and (b) the City, after notice, approves the additional service and amount of compensation therefor.

2. Payment. City shall pay Consultant for services rendered pursuant to this Agreement at the times and in the manner set forth in Exhibit "B". The payments specified in Exhibit "B" shall be the only payments to be made to Consultant for services rendered pursuant to this Agreement, unless the City approves additional compensation for additional service. Consultant shall submit all billings for services rendered pursuant to this Agreement to City

in the manner specified in Exhibit "B"; or, if no manner be specified in Exhibit "B", then according to the usual and customary procedures and practices which Consultant uses for billing clients similar to City.

3. Facilities and Equipment. Except as set forth in Exhibit "A", Consultant shall, at its sole cost and expense, furnish all facilities and equipment which may be required for furnishing services pursuant to this Agreement. City shall furnish to Consultant only the facilities and equipment listed in Exhibit "A" according to the terms and conditions set forth in Exhibit "A".

4. General Provisions. The general provisions set forth in Exhibit "D" are part of this Agreement. In the event of any inconsistency between said general provisions and any other terms or conditions of this Agreement, the other term or condition shall control insofar as it is inconsistent with the general provisions.

5. Exhibits. All exhibits referred to herein are attached hereto and are by this reference incorporated herein.

Executed as of the day and year first above stated.

CITY OF SACRAMENTO
A Municipal Corporation

By _____

ATTEST:

CITY CLERK

JAMES M. MONTGOMERY
Consulting Engineers, Inc.

By _____

By _____

EXHIBIT "A"

The primary goals of this project are:

1. Develop a comprehensive computerized model of the City of Sacramento Water Distribution System.
2. Evaluate and recommend a long-term method for use of the model by the City.
3. Provide training to City staff in the use and updating of the model.

The specific tasks to be provided by the Consultant during this project are as follows:

Task 1 - Refine Modeling Goals

Working with the Division staff Consultant will:

- Review project goals and objectives
- Determine purpose and level of detail for the model
- Determine amount and type of data available
- Define method of calibrating and verifying the model to allow for correct data collection
- Establish criteria and assess the extent of data collection required
- Define data handling procedures

Task 2 - Review Background Information

Again, working with the Division staff, Consultant will assemble all available relevant information and data on items such as:

- Pipe ages, type, sizes, and locations
- Locations of valves and hydrants
- Water use records
- Existing well production records
- Land use data (where required)
- Location of major water users and information on usage
- Pressures and flows at various points in the system

It is assumed that the collection and assembly of the above information would be done primarily by the Division. JMM would assist in review and evaluation of the information collected and development of the program data base.

Task 3 - Evaluate System Operation

This task would involve working with Division personnel to define and assess current system operation. This work would include:

- Discussing system operation and strategies with operation and supervisory personnel
- Incorporating currently planned system improvements into the model
- Definitively assessing information on existing supply and storage facilities

Task 4 - Assign Water Demands

Information collected and evaluated in Tasks 2 and 3 will be used to create a data base and determine system water demands. These demands will be determined and distributed throughout the water system by computer using our ADEMAND program, a part of this task:

- Major water users will be considered separately
- Peaking factors for maximum day and peak hour demands will be established
- Fire flow requirements will be determined using the latest Insurance Service Office (ISO) guidelines
- System losses will be considered and factored into the demand conditions
- The data base for the model will be completed

Task 5 - Develop and Calibrate Model

Using JMMLIN, a modified version of the "Kentucky Program" for hydraulic network analyses, the Consultant will develop the basic water distribution system model. This work essentially involves:

- Schematically representing the distribution system
- Calculating and assigning water demands
- Entering the data base for system analysis using Consultants VAX 11/780 computer
- Analyzing input and output to debug program and establish a successful static base model

Calibration is a series of three steps plus verification. This includes:

1. Selecting appropriate calibration conditions, that is, the standard against which the model should be measured. Critical parameters such as flow, pressure and reservoir levels would be chosen.
2. Measuring the calibration variables in the physical system. It is assumed that the field measurements would be made by Division personnel. Ideally these measurements should be made at a time when the system is under stress such as fire flow, or maximum day demands occurring in late summer. When it is not practical to measure certain stress conditions, a simulation is performed and the results compared with recorded data.
3. Adjust the model parameters to match the simulated variables to the field measured values. This involves statistical analyses to determine a "good fit" for the data. Typically a standard deviation of 5 to 10 percent in flows and pressures is considered acceptable.

Verification of the calibrated model is the engineers first attempt to insure that the model is working properly, that it simulates "real world" conditions. It establishes the truth, accuracy, and reality of the model. It differs from the calibration steps in two important ways; there is no iterative process for correction or adjustment and the requirements of precision may be relaxed. Typically, verification of the model is obtained by comparing the results of computer runs for a condition considerably different from the one used in calibration.

Task 6 - Model Application

This task would include making a series of computer runs to evaluate 10 alternatives selected by the Division. The results of these runs would be analyzed and interpreted by JMM together with the project engineer for the Division.

Task 7 - Training and Implementation

JMM would evaluate and recommend to the Division the best means to provide for future access and use of the completed computer model. Such options as a phone link-up, remote terminal or rental of time from a branch office or service agency will be evaluated.

Task 8 - Prepare Summary Report

A brief summary report would be prepared by JMM for the project. This report would include:

- A discussion of the Sacramento water distribution system model
- Results of the computer runs for the various alternatives considered in the form of actual program output
- Information on use of the program

SCHEDULE

Work shall proceed within 10 days after notification by the City and shall be completed within 6 months unless modified by the City.

PROJECT TEAM

JMM shall provide the project team as outlined in the proposal for development of a computerized water distribution system model. Changes can be made only with the written authorization by the City

EXHIBIT "B"

COMPENSATION

Compensation for services provided under this Agreement shall be on a cost reimbursement basis in accordance with the attached Schedule of Fees and Conditions.

Direct costs incurred during performance of the work, such as reproduction, printing, communications, computer usage, travel and subcontracted services shall be billed at cost plus 15%.

Total compensation for services shall not exceed \$80,000 without prior written approval.

Payment by the City shall be made monthly within 30 days of receipt of a monthly invoice which itemizes all billable costs as determined by the Consultant and approved by the City.

SCHEDULE OF FEES AND CONDITIONS
James M. Montgomery, Consulting Engineers, Inc.

A. FEES AND PAYMENT

1. The fee for services will be based on salary cost plus 130 percent of said salary costs. When field engineering services are to be performed by field personnel, the fee will be salary cost plus 120 percent. Salary cost is the cost of salaries (including sick leave, vacation, holiday and incentive pay) of personnel for time directly chargeable to the project; plus unemployment, excise, and payroll taxes; contributions for social security, employment compensation insurance, retirement, medical, and insurance benefits and for the purpose of this project, salary costs are defined as 1.3 times actual payroll. Non-salary expenses directly attributable to the project like (1) living and traveling expenses of employees when away from the home office on business connected with the project, (2) identifiable communication expenses, (3) identifiable drafting and stenographic supplies and expenses, and (4) identifiable reproduction costs applicable to the work will be charged at actual cost plus 15 percent service charge. For use of VAX 11/780 computer, fees will be in accordance with the most recent computer fee schedule. For services provided by Montgomery's approved water quality laboratory, fees will be in accordance with the most recent laboratory fee schedule.
2. The fee for Outside Services will be at actual cost plus 15 percent of actual cost to cover overhead and administration.
3. Payment shall be due within 30 days after date of monthly invoice describing the work performed and expenses incurred during the preceding month.
4. In order to defray carrying charges resulting from delayed payments, simple interest at the rate of ten percent (10%) per annum (but not exceeding the maximum rate allowed by law) will be added to the unpaid balance of each invoice. The interest period shall commence 30 days after date of original invoice and shall terminate upon date of payment. Payments will be first credited to interest and then to principal. No interest charge will be added during the initial 30-day period following date of invoice.

B. COMMENCEMENT OF WORK

The work will be commenced immediately upon receipt of notice to proceed. If after commencement of work the project is delayed for any reason beyond the control of Montgomery for more than 60 days, the terms and conditions contained herein are subject to revision.

C. MISCELLANEOUS PROVISIONS

1. BOOKS OF ACCOUNT. Montgomery will maintain books and accounts of payroll costs, travel, subsistence, field and incidental expenses. Said books will be available at all reasonable times for examination by the client at the Corporate office of Montgomery.
2. INSURANCE
 - (a) Montgomery will maintain insurance as will protect the client from claims under the Worker's Compensation Laws and from General Liability claims for bodily injury, or death, or property damage which may arise from the negligent performance by its employees in the functions and services required under this Agreement.
 - (b) Montgomery agrees to maintain Professional Liability insurance to protect the client from Montgomery's negligent acts, errors or omissions of a professional nature; the total aggregate of Montgomery's professional liability, however, to all parties related to this Agreement shall not exceed \$50,000 or the total amount of Montgomery's fee, whichever amount is greater.
3. DOCUMENTS. All tracings, survey notes, ^{computer program} and other original documents as instruments of service are and shall remain the property of Montgomery, ~~except where by law or precedent these documents become public property.~~ of the City of Sacramento.
4. TERMINATION OR ABANDONMENT. If any portion of the work is terminated or abandoned by the client then the provisions of this Schedule of Fees and Conditions in regard to compensation and payment shall apply insofar as possible to that portion of the work not terminated or abandoned. If said termination occurs prior to completion of any phase of the project, the fee for services performed during such phase shall be based on Montgomery's reasonable estimate of the portion of such phase completed prior to said termination, plus a reasonable amount to reimburse Montgomery for termination costs.
5. REVISION OF TERMS. If notice to proceed is delayed for any reason beyond 90 days, the terms and conditions contained in this schedule are subject to revision.
6. ATTORNEY'S FEES. If either party becomes involved in litigation arising out of this contract or the performance thereof, the court in such litigation shall award reasonable costs and expenses, including attorney's fees to the party justly entitled thereto. In awarding attorney's fees, the court shall not be bound by any court fee schedule, but shall, if it is in the interest of justice to do so, award the full amount of costs, expenses and attorney's fees paid or incurred in good faith.
7. SUCCESSORS AND ASSIGNS. All of the terms, conditions and provisions hereof shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns provided, however, that no assignment of the contract shall be made without written consent of the parties to the agreement.

EXHIBIT "C"

See Exhibit "A".

EXHIBIT D

GENERAL PROVISIONS

1. Independent Contractor. At all times during the term of this Agreement, Consultant shall be an independent contractor and shall not be an employee of City. City shall have the right to control Consultant only insofar as the results of Consultant's services rendered pursuant to this Agreement; however, City shall not have the right to control the means by which Consultant accomplishes services rendered pursuant to this Agreement.

2. Licenses; Permits; Etc. Consultant represents and warrants to City that he has all licenses, permits, qualifications and approvals of whatsoever nature which are legally required for Consultant to practice his profession. Consultant represents and warrants to City that Consultant shall, at his sole cost and expense, keep in effect or obtain at all times during the term of this Agreement any licenses, permits, and approvals which are legally required for Consultant to practice his profession at the time the services are performed.

3. Time. Consultant shall devote such time to the performance of services pursuant to this Agreement as may be reasonably necessary for satisfactory performance of Consultant's obligations pursuant to this Agreement. Neither party shall be considered in default of this Agreement to the extent performance is prevented or delayed by any cause, present or future, which is beyond the reasonable control of the party.

4. Insurance.

(a) Public Liability. During the term of this Agreement, Consultant shall maintain in full force and effect a policy of public liability insurance with minimum coverages as follows: \$100,000.00 for injury to one person in any one occurrence; \$300,000.00 for injury to more than one person in any one occurrence; and, \$50,000.00 for property damage. If City so requests, Consultant shall cause City to be named as an additional assured on said policy and shall obtain a waiver of the insurer's right of subrogation against City.

(b) Workman's Compensation. During the term of this Agreement, Consultant shall fully comply with the terms of the law of California concerning workman's compensation. Said compliance shall include, but not be limited to, maintaining in full force and effect one or more policies of insurance insuring against any liability Consultant may have for workman's compensation.

(c) Errors and Omissions; Malpractice. In the event City requests Consultant to carry errors and omissions insurance or malpractice insurance, Consultant shall take out and keep in full force and effect during the term of this Agreement a policy in form and content satisfactory to City which shall indemnify City against errors and omissions or malpractice by Consultant. Said policy or policies shall provide liability coverage in an amount specified by City in its request.

5. Consultant Not Agent. Except as City may specify in writing, Consultant shall have no authority, express or implied, to act on behalf of City in any capacity whatsoever as an agent. Consultant shall have no authority, express or implied, pursuant to this Agreement to bind City to any obligation whatsoever.

6. Assignment Prohibited. No party to this Agreement may assign any right or obligation pursuant to this Agreement. Any attempted or purported assignment of any right or obligation pursuant to this Agreement shall be void and of no effect.

7. Personnel. Consultant shall assign only competent personnel to perform services pursuant to this Agreement. In the event that City, in its sole discretion, at any time during the term of this Agreement, desires the removal of any person or persons assigned by Consultant to perform services pursuant to this Agreement, Consultant shall remove any such person immediately upon receiving notice from City of the desire of City for the removal of such person or persons.

8. Standard of Performance. Consultant shall perform all services required pursuant to this Agreement in the manner and according to the standards observed by a competent practitioner of the profession in which Consultant is engaged in the geographical area in which Consultant practices his profession. All products of whatsoever nature which Consultant delivers to City pursuant to this Agreement shall be prepared in a substantial, first class and workmanlike manner and conform to the standards of quality normally observed by a person practicing in Consultant's profession.

9. City Representative. The City Engineer is the representative of the City and will administer this Agreement for the City.

10. Termination. City shall have the right to terminate this Agreement at any time by giving notice of such termination to Consultant. In the event City shall give such notice of termination, Consultant shall immediately cease rendering services pursuant to this Agreement.

In the event City shall terminate this Agreement:

(1) Consultant shall deliver copies of all writings prepared by it pursuant to this Agreement. The term "writings" shall be construed to mean and include:

handwriting, typewriting, printing, photostating, photographing, and every other means of recording upon any tangible thing any form of communication or representation, including letters, words, pictures, sounds, or symbols, or combinations thereof.

(2) City shall have full ownership and control of all such writings delivered by Consultant pursuant to this Agreement;

(3) City shall pay Consultant the reasonable value of services rendered by Consultant pursuant to this Agreement; provided, however, City shall not in any manner be liable for lost profits which might have been made by Consultant had Consultant completed the services required by this Agreement. In this regard, Consultant shall furnish to City such financial information as in the judgment of the City Engineer is necessary to determine the reasonable value of the services rendered by Consultant. In the event of a dispute as to the reasonable value of the services rendered by Consultant, the decisions of the City Engineer shall be final. The foregoing is cumulative and does not affect any right or remedy which City may have in law or equity.