

CAVE CREEK FLOOD CONTROL PROJECT

Maricopa County, Arizona

ADVERTISEMENT, PROPOSAL

SPECIFICATIONS

AND

DRAWINGS

CAVE CREEK DAM

Proposals received at Phoenix, Arizona, until 2:00 o'clock

December 17th, 1921

C-1-350

A690.501

C A V E C R E E K F L O O D C O N T R O L P R O J E C T

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MARICOPA COUNTY, ARIZONA.

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11/17/21

C-1-350

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SEC

ADVERTISEMENT

Phoenix, Arizona,
November 10, 1921.

Sealed proposals will be received at the office of the Salt River Valley Water User's Association, at Phoenix, Arizona, until two o'clock p.m., Saturday, December 17th, 1921, for the construction of the Gave Creek Flood control dam and appurtenances, in Maricopa County, Arizona.

The plans and specifications for this construction may be secured from the Chairman of the Gave Creek Flood Control Board at the office of the City Manager, Phoenix, Arizona, on the payment of a fee of Five (\$5.00) Dollars. Bids are requested on plans involving the construction of approximately Three Hundred and Seventy Thousand (370,000) cubic yards of embankment; Ten Thousand (10,000) cubic yards of concrete; Five Hundred and Forty Thousand (540,000) pounds of reinforcing Steel and twenty-five thousand (25,000) square yards of rip-rap. In addition contractors may be furnished plans and specifications for an alternate design for the construction of a reservoir of the capacity indicated on the proposed plans; and the Board will welcome and consider any other alternate plans and specifications submitted by contractors.

STATE OF ARIZONA

By Thomas Maddock,
State Engineer.

BOARD OF SUPERVISORS OF
MARICOPA COUNTY,

By Guy F. Vernon,
Chairman.

SALT RIVER VALLEY WATER USERS'
ASSOCIATION,

By C. C. Cragin,
Genl. Supt. and Chief Engr.

PARADISE VERDE IRRIGATION DISTRICT,

By E. W. Michael,
President.

CITY OF PHOENIX,

By V. A. Thompson,
City Manager.

NOTICE TO BIDDERS

No proposal will be considered for only a part of a schedule.
Each proposal must be accompanied by a certified check payable to the order of the Cave Creek Flood Control Board, for the sum of \$10,000. as a guarantee that the bidder will, if successful, promptly execute a satisfactory contract and furnish bond for the faithful performance of the work, as required by paragraph -5- of these specifications .

Proposals must be marked " Proposals for Construction at Cave Creek Flood Control Bas", and addressed to the Cave Creek Flood Control Board, Phoenix, Arizona.

BOHRNILE 1
(Spillway Elevation 1638)

Item	Work or Material	Quantity	Unit Price	Amount
1	Clearing and grubbing	40 Acres	\$ 25 ⁰⁰ per acre	\$ 1000
2	Excavation Wasteway Channel	20,000 cu.yds.	\$ 1 ⁴⁰ per cu.yd.	\$ 28000
3	Excavation for structures drawings 4 and 5	850 cu.yds.	\$ 2 ⁵⁰ per cu.yd.	\$ 2125
4	Concrete in retaining Wall	850 cu.yds.	\$ 22 ⁰⁰ per cu.yd.	\$ 18700
5	Reinforcing Steel in Retaining wall	108,000 pounds	\$ 10 ⁴ per pound	\$ 10,500
6	Concrete Section of Dam: Concrete	1,600 cu.yds.	\$ 22 ⁰⁰ per cu. yd.	\$ 35,200
7	Concrete section of Dam; Reinforcing Steel	120,000 pounds	\$ 10 ⁴ per pound	\$ 12,000
8	Excavation of cut-off trench 8 ft. wide @ elevation 1582, exclusive of solid rock	3,850 cu.yds.	\$ 2 ⁰⁰ per cu.yd.	\$ 7,700
9	Excavation of cut-off trench below elev. 1582:			
	a. 0 ft. to 3 ft. below 1582	1,000 cu.yds.	\$ 2 ⁵⁰ per cu.yd.	\$ 2,500
	b. 3 ft. to 6 ft. below 1582	660 cu.yds.	\$ 2 ⁵⁰ per cu.yd.	\$ 2,150
	c. 6 ft. to 9 ft. below 1582	770 cu.yds.	\$ 3 ⁵⁰ per cu.yd.	\$ 2,695
	d. 9 ft. to 12 ft. below 1582	690 cu. yds.	\$ 3 ⁵⁰ per cu.yd.	\$ 2,415
	e. 12 ft. to 15 ft. below 1582	450 cu.yds.	\$ 4 ⁰⁰ per cu.yd.	\$ 1,800
	f. 15 ft. to 18 ft. below 1582	120 cu. yds.	\$ 5 ⁰⁰ per cu.yd.	\$ 600
	g. Excavation of rock or hard cemented material in bottom of trench	180 cu.yds.	\$ 7 ⁰⁰ per cu.yd.	\$ 1,260
10	Excavation of corewall trench 4 ft. wide to elevation 1582	1780 cu.yds.	\$ 4 ⁰⁰ per cu.yds.	\$ 7120
11	Excavation of corewall trench 4 ft. wide below elev. 1582			
	a. 0 ft. to 3 ft. below 1582	500 cu.yds.	\$ 4 ⁵⁰ per cu. yd.	\$ 2,250
	b. 3 ft. to 6 ft.	450 cu.yds.	\$ 5 ⁰⁰ per cu. yd.	\$ 2,250

PROPOSAL

For Construction of Cave Creek Control Dam, Maricopa County, Arizona.

_____ 1921.

To The Cave Creek Flood Control Board .

Sir:

Pursuant to the foregoing advertisement, the undersigned bidder proposes to do all the work and to furnish all the material as provided by the attached specifications, and binds himself on the acceptance of this proposal to execute a contract with necessary bond, of which this proposal and the said advertisement and specifications shall be a part, for performing and completing said work within the time required by the specifications and at the prices named in the schedules hereto annexed.

The bidder furthermore agrees that, in case of his default in executing said contract with necessary bond, the check accompanying this proposal and the money payable thereon shall be and remain the property of the Cave Creek Flood Control Board as liquidated damages.

Signature _____

(Corporate Seal)

Address _____

Names of Individual members of
firm or names and titles
of all Officers of
Corporation.

Corporation organized under the laws of the State of _____

Item	Work or Material	Quantity	Unit Price	Amount
11	c. 6 ft. to 9 ft. below 1582	280 cu.yds.	\$ 6 ⁰⁰ per cu.yd.	138.405 2280
	d. 9 ft. to 12 ft. below 1582	350 cu.yds.	\$ 7 ⁰⁰ per cu. yd.	2450
	e. 12 ft. to 15 ft. below 1582	250 cu.yds.	\$ 8 ⁰⁰ per cu.yd.	2000
	f. 15 ft. to 18 ft. below 1582	60 cu.yds.	\$ 8 ⁰⁰ per cu.yd.	480
	g. 18 ft. to 21 ft. below 1582	cu. yds.	\$ — per cu.yd.	
	h. 21 ft. to 24 ft. below 1582	cu.yds.	\$ — per cu.yd.	
	i. Excavation of rock or hard cemented material in bottom of trench	350 cu.yds.	\$ 12 ⁰⁰ per cu.yd.	4200
12	Concrete in corewall below elev. 1587	3100 cu.yds.	\$ 15 ⁰⁰ per cu. yd.	46500
13	Concrete in Corewall above elev. 1587	4000 cu.yds.	\$ 20 ⁰⁰ per cu.yd.	80000
14	Reinforcing Steel in Corewall	295,000 pounds	\$ 10¢ per pound	29500
15	Embankment: tight fill upstream side of corewall	140,000 cu.yds.	\$ 65¢ per cu.yd.	91000
16	Embankment: gravel fill upstream side of corewall	50,000 cu.yds.	\$ 65¢ per cu.yd.	32500
17	Embankment: downstream side of corewall ex- clusive of coarse fill	155,000 cu.yds.	\$ 65¢ per cu.yd.	100750
18	Embankment: coarse material downstream side of corewall	20,000 cu.yds.	\$ 65¢ per cu.yd.	13000
19	Riprap	24,000 sq.yds.	\$ 2 ⁰⁰ per sq.yd.	48000
20	Spillway excavation	10,000 cu.yds.	\$ 1 ³⁰ per cu.yd.	13000
21	Concrete in spillway wall	200 cu.yds.	\$ 15 ⁰⁰ per cu.yd.	3000
22				
23	Wood rail on concrete section of dam	520 lin.ft	\$ 2 ⁵⁰ per lin. ft.	1300
24	Special Expansion Joint	1	\$ 200 ⁰⁰	200

601225

SCHEDULE 2
(Spillway at elevation 1841)

Item	Work or Material	Quantity	Unit Price	Amount
1	Clearing and grubbing	40 acres	\$ 25 ⁻	per acre \$
2	Excavation Wasteway Channel	20,000 cu.yds.	\$ 1 ⁴⁰	per cu.yd.\$
3	Excavation for Structures	400 cu.yds.	\$ 2 ⁰⁰	per cu.yd.\$
4	Concrete in retaining wall	1000 cu.yds.	\$ 22 ⁻	per cu.yd.\$
5	Reinforcing Steel in retaining wall	122,000 pounds	\$.10	per pound \$
6	Concrete Section of dam; Concrete	1,800 cu.yds.	\$ 22 ⁻	per cu.yd \$
7	Concrete Section of dam; Reinforcing Steel	187,000 pounds	\$.10	per pound\$
8	Excavation of cut off trench 6 ft.wide- to elev.1862 exclusive of solid rock	cu. yds.	\$ 2 ⁻	per cu.yd.\$
9	Excavation of cut-off trench below elev.1862;			
	a. 0 ft. to 3 ft. below 1862	1,000 cu.yds.	\$ 2 ⁵⁰	per cu.yd.\$
	b. 3 ft. to 6 ft. below 1862	660 cu.yds.	\$ 2 ⁵⁰	per cu.yd.\$
	c. 6 ft. to 9 ft. below 1862	770 cu.yds.	\$ 3 ⁵⁰	per cu.yd.\$
	d. 9 ft. to 12 ft. below 1862	690 cu.yds.	\$ 3 ⁵⁰	per cu.yd.\$
	e. 12 ft. to 15 ft. below 1862	480 cu.yds.	\$ 4 ⁻	per cu.yd.\$
	f. 15 ft. to 18 ft. below 1862	120 cu.yds.	\$ 5 ⁻	per cu.yd.\$
	g. Excavation of rock or hard cemented material in bottom of trench	180 cu.yds.	\$ 7 ⁻	per cu.yd.\$
10	Excavation of overflow trench 4 ft. wide to elev.1862-1780	1780 cu.yds.	\$ 4 ⁻	per cu.yd. \$
11	Excavation of overflow trench 4 ft. wide-below elev. 1862;			
	a. 0 ft. to 3 ft. below 1862	800 cu.yds.	\$ 4 ⁵⁰	per cu.yds.\$
	b. 3 ft. to 6 ft. below 1862	480 cu.yds.	\$ 5 ⁵⁰	per cu.yd. \$

Item	Work or Material	Quantity	Unit Price	Amount
11	e. 6 ft. to 9 ft. below 1582	990 cu. yds.	\$ -	per cu.yd. \$
	d. 9 ft. to 12 ft. below 1582	350 cu.yds.	\$ 17	per cu.yd. \$
	c. 12 ft. to 15 ft. below 1582	250 cu.yds.	\$ 8	per cu.yd. \$
	f. 15 ft. to 18 ft. below 1582	60 cu.yds.	\$ 8	per cu.yd.\$
	g. 18 ft. to 21 ft. below 1582	cu.yds.	\$ -	per cu.yds.\$
	h. 21 ft. to 24 ft. below 1582	cu.yds	\$ -	per cu.yd. \$
	i. Excavation of rock or hard cemented material in bottom of trench	360 cu.yds.	\$ 17	per cu.yd. \$
12	Concrete in corewall above elev. 1587	3,100 cu.yds.	\$ 15	per cu.yds.\$
13	Concrete in corewal below elev.1587	4,150 cu.yds.	\$ 20	per cu.yds.\$
14	Reinforcing steel in corewall above elev. 1587	307,000 pounds	\$.10	pounds \$
15	Embankment: tight fill upstream side of corewall	155,000 cu.yds	\$.65	per cu.yds.\$
16	Embankment: gravel fill upstream side of corewall	58,000 cu.yds.	\$.65	per cu.yd.\$
17	Embankment: fill on down- stream side of corewall exclusive of coarse mat- erial fill	170,000 cu.yds.	\$.65	per cu.yd.\$
18	Embankment: coarse material fill, downstream side of corewall	12,000 cu.yds.	\$.65	per cu.yd. \$
19	Riprap	25,000 sq.yds.	\$ 2	per sq.yd. \$
20	Spillway excavation	1,000 cu.yds.	\$ 1	per cu.yd. \$
21	Concrete in spillway wall	400 cu.yds	\$ 15	per cu.yd. \$
22				
23	Handrail on concrete section of dam	335 lin.ft.	\$ 2.50	per lin ft.\$
24	Special Expansion Joint	1		\$

SPECIFICATIONS

GENERAL CONDITIONS

1 - Form of proposal and Signature - The proposal shall be made on the form provided therefor and shall be enclosed in a sealed envelope and addressed as required in the notice to bidders. The bidder shall state in words and in figures the unit prices or the specific sums for which he proposes to supply the material and perform the work required by these specifications. If the proposal is made by an individual, it shall be signed with his full name, and his address shall be given; if it is made by a firm it shall be signed with the co-partnership name by a member of the firm, and the name and full address of each member shall be given, and if it is made by a corporation it shall be signed by an officer with the corporate name attested by the corporate seal, and the names and titles of all officers of the corporation shall be given.

2 - Proposal - Blank spaces in the proposal should be properly filled. The paraphrasing of the proposal should not be changed, and no additions should be made to the items mentioned therein. Unauthorized conditions, limitations or provisions attached to a proposal will render it informal and may cause its rejection. Alterations by erasure or interlineation must be explained or noted in the proposal over the signature of the bidder. If the unit price and total amount named by a bidder for any item do not agree, the unit price alone will be considered. A bidder may withdraw his proposal before the expiration of the time during which proposals may be submitted, without prejudice to himself, by submitting a written request for its withdrawal to the officer who holds it. No proposals received after said time will be considered. Bidders are invited to be present at the opening of the proposals. The right is reserved to reject any or all proposals, and to waive any informalities, as the interests of the Gave Creek Flood Control Board may require.

3 - Certified Check - Each bidder shall submit with his proposal a certified check for the sum stated in the notice to bidders, drawn to the order of Gave Creek Flood Control Board, hereinafter styled Board. If the bidder to whom an award is made fails or refuses to execute the required contract and bond within the time specified in paragraph 4, the proceeds of his check shall become the property of the Board. The proceeds of the check of the successful bidder will be returned after the execution of his contract and the approval of his bond on behalf

of the Board, and the proceeds of the checks of the other bidders will be returned at the expiration of forty-five days from the date of opening proposals, or sooner at the option of the Board. All checks will, upon receipt thereof, be deposited to the credit of the Board, and the proceeds thereof, when due, will be returned by check.

4 - The Contract - The bidder to whom award is made shall execute a written contract with the Board and furnish surety bond with a company whose responsibility is recognized by the United States Government on Government work. The bonds shall be as provided in form attached to these specifications. The contractor shall execute bond within fifteen days after receiving form of contract and bonds for execution.

The form of contract may be examined at the office of the City Manager, Phoenix, Arizona, or copies will be furnished upon request to parties wishing to bid. If the bidder to whom award is made fails to enter into a contract as herein provided, the award shall be annulled and award may be made to the bidder whose proposal is next most acceptable in the opinion of the Board.

(a) - If the bidder to whom an award is made fails to enter into a contract as herein provided, the award will be annulled, and an award may be made to the bidder whose proposal is next most acceptable in the opinion of the Board by whom the first award was made; and such bidder shall fulfill every stipulation embraced herein as if he were the party to whom the first award was made. The advertisement, notice to bidders, proposal, general conditions, and detail specifications will be incorporated in the contract. A corporation to which an award is made will be required, before the contract is fully executed, to furnish certificate of its corporate existence and evidence that the Officer signing the contract for the Corporation is duly authorized to do so.

5 - Contractors' bond - The contractor agrees to promptly pay all obligations whatsoever, incurred by him or his agents in the performance of this contract or the furtherance of his work within the State of Arizona. Upon the failure of the contractor to meet such obligations, the Board is authorized to pay the same out of any money due the contractor. The Board may also have recourse to the

contractor's bond guaranteeing the performance of his contract, for the payment of such obligations. The failure of the contractor to meet such obligations shall also be sufficient cause for the cancellation of this contract.

6 - Transfers - Transfer of this contract or any interest therein is prohibited without the consent of the Board.

7 - Board - The word "board", when used in the specifications or in the contract, shall mean the Gave Creek Flood Control Board, consisting of one representative of the Paradise-Verde Irrigation District. The State of Arizona, the City of Phoenix, the County of Maricopa, and the Salt River Valley Water Users' Association.

(a) The word "Engineer", when used in these specifications or in the contract shall mean the party appointed by the Board as their authorized representative on the work. He may be represented by assistants and inspectors authorized to act for him. On all questions concerning the acceptability of material or machinery, the classification of material, the execution of the work, conflicting interests of contractors performing related work, and the determination of costs under these plans and specifications, the decision of the engineer shall be binding.

8 - Contractor - The word "contractor" used in these specifications or in the contract, means the person, firm or corporation with whom the contract is made by the Board.

The contractor shall at all times be represented on the works in person or by foreman or duly designated agent. Instructions and information given by the engineer to the contractor's foreman or agent on the work shall be considered as having been given to the contractor. When two or more contractors are engaged on installations or construction work in the same vicinity the engineer shall be authorized to direct the manner in which each shall conduct his work so far as it affects other contractors.

9 - Samples and Specimens - The contractor shall submit samples or specimens of such materials to be furnished or used in the work as the engineer may require.

10 - Material and Workmanship - All materials must be of the specified

quality and equal to approved samples if samples have been submitted. All work shall be done and completed in a thorough workmanlike manner, notwithstanding any omission from these specifications or ^{the} drawings. All materials furnished and all work done must be satisfactory to the engineer. Work not in accordance with these specifications, in the opinion of the engineer, shall be made to conform thereto. Unsatisfactory material will be rejected, and, if so ordered by the engineer, shall, at the contractor's expense, be immediately removed from the vicinity of the work.

11 - Delays - The contractor shall receive no compensation for delays or hindrances to the work except when, in the judgment of the engineer, direct and unavoidable extra cost to the contractor is caused by the failure of the Board to provide necessary information, right of way, or site for installation. When such extra compensation is claimed a written statement thereof shall be presented by the contractor not later than ten days after the close of the month during which extra cost is claimed to have been incurred. Such claim, if found correct, will be approved and the decision of the engineer whether extra cost has been incurred, and the amount thereof shall be final. If delays are caused by specific orders to stop work given by the engineer, or by the performance of extra work, or by unforeseen causes beyond the control of the contractor, or by the failure of the Board to provide necessary instructions, for carrying on the work or to provide the necessary right of way or site for installation, then such delay will entitle the contractor to an equivalent extension of time, except as otherwise provided in paragraph 20. Application for extension of time must be approved by the Board, and shall be accompanied by the formal consent of the sureties, but an extension of time, whether with or without such consent, shall not release the sureties from their obligations, which shall remain in full force until the discharge of the contract.

12 - Suspension of Contract - If the contractor fails to begin the delivery of the material or to commence work as provided in the contract, or fails to make deliveries of materials promptly as ordered, or to maintain the rate of delivery of material or progress of the work in such manner as to insure a full compliance with the contract within the time limit, or if in the judgment of the engineer the contractor is not carrying out the provisions of the contract in their

true intent and meaning, written notice will be served on him to provide within a specified time for a satisfactory compliance with the contract, and if he neglects or refuses to comply with such notice, the Board may suspend the operation of all or any part of the contract, or he may in discretion after such notice purchase any or all of the material without suspending the contract.

Upon suspension of a contract for construction or installation, the Board may at their discretion take possession of all or any part of the machinery, tools, appliances, animals, materials, and supplies used on the work covered by the contract, or that have been shipped or delivered by or on account of the contractor for use in connection therewith, and the same may be used either directly or by the Board, or by other parties for it, for the completion of the work suspended; or the Board may employ other parties to perform the work, or may substitute other machinery or materials, purchase the material contracted for in such manner as it may deem proper, or hire such force and buy such machinery, tools, appliances, animals, materials, and supplies at the contractor's expense as may be necessary for the proper conduct and completion of the work. Any cost to the Board in excess of the contract price, arising from the suspension of the contract, will be charged to the contractor and his sureties, who shall be liable therefor.

A special lien to secure the claims of the Board in the event of suspension of the contract is hereby created against any property of the contractor taken into the possession of the Board under the terms hereof, and such lien may be enforced by a sale of such property under the direction of the Board, and the proceeds of the sale, after deducting all expenses thereof and connected therewith, shall be credited to the contractor. If such net proceeds shall be in excess of the claims of the Board against the contractor, the balance will be paid to the contractor or his legal representatives. If, in the opinion of the engineer, there is an emergency for the furnishing of certain material or the performance of certain work in order to insure compliance with the terms of the contract, and if the contractor fails to furnish such material or to perform such work within a reasonable time fixed by written notice from the engineer to the contractor, then the Board shall have the power to furnish such material or to perform such work at the expense of the contractor and his sureties, who shall be liable therefor. In the determination of the question whether there has been such noncompliance with the contract as to warrant its suspension or the furnishing of material or the performance of work by the Board

as herein provided, the decision of the engineer shall be final.

13 - Changes - The Board may, without notice to the sureties on the contractor's bond, make such changes in the designs or material or machinery or plans for installation or construction or in the quantities or character of the work or material required as they may deem advisable. These changes in plans for installation or construction may also include modifications of shapes and dimensions of dam and other structures, and the shifting of locations to suit conditions disclosed as work progresses. If such changes result in an increase or decrease of cost to the contractor, the Board will make such additions or deductions on account thereof as they may deem reasonable and proper, and their action thereon shall be final. Extra work or material shall be charged for as hereinafter provided.

14 - Extra Work or Material - In connection with the work covered by this contract, the Board may order work or material not covered by the specifications. Such work or material will be classed as extra work, and will be ordered in writing. Extra work will be charged for a actual necessary cost, as determined by the engineer, plus fifteen (15) per cent for profit, superintendence and general expense, and use of equipment. The actual necessary cost will include all expenditures for materials, labor and supplies furnished by the contractor, but will not include any allowance for office expenses, general superintendence or other general expenses. At the end of each month the contractor shall present in writing his claims for extra work and material and, when requested by the engineer shall furnish itemized statements of the cost and shall permit examination of accounts, bills and vouchers relating thereto.

15 - Changes at Contractor's request - If the contractor, on account of conditions developing during the progress of the work, finds it impracticable to comply strictly with these specifications and applies in writing for a modification of the structural requirements or of methods of work, such change may be authorized by the Board, if not detrimental to the work and if without additional cost to the Board.

16 - Inspection - All materials furnished and work done under this contract will be subject to rigid inspection. The contractor shall furnish complete facilities including the necessary labor for inspection of all material and workmanship. The engineer shall have at all times access to all parts of the shop where such material under his inspection is being manufactured. Material that does not conform to the specifications, accepted through oversight, or otherwise, may be rejected at any stage

of the work. Whenever the contractor on installation or constructions is permitted or directed to do night work or to vary the period during which work is carried on each day, he shall give the engineer due notice, so that inspection may be provided for. Such work shall be done without extra compensation and under regulations to be furnished in writing by the engineer.

17 - Errors and Omissions -

The contractor will not be allowed to take advantage of any error or omission in these specifications. Suitable instructions will be given when such error or omission is discovered.

18 - Contractor's Financial Obligations -

The contractor shall promptly make payments to all persons supplying labor and materials in the execution of the contract, and a condition to this effect shall be incorporated in the contractor's bond.

19 -

20 - Specifications and Drawings -

The contractor shall keep on the work a copy of the specifications and drawings, and shall at all times give the engineer access thereto. Any drawings or plans listed in the detail specifications shall be regarded as part thereof and of the contract. Anything mentioned in these specifications and not shown in the drawings or shown in the drawings and not mentioned in these specifications shall be deemed as though shown or mentioned in both. The Engineer will furnish from time to time such detail drawings, profiles and information as he may consider necessary for the contractor's guidance.

21 - Local Conditions -

Bidders shall satisfy themselves as to local conditions affecting the work and no information derived from the maps, plans, specifications, profiles or drawings, or from the engineer or his assistants, will relieve the contractor from any risk or from fulfilling all of the terms of his contract.

The accuracy of the interpretation of the facts disclosed by borings or other preliminary investigations is not guaranteed. Each bidder or his representative should visit the site of the work and familiarize himself with local conditions; failure to do so when intelligent preparation of bids depends on a knowledge of local conditions may be considered sufficient cause for rejecting a proposal.

22 - Data to be Furnished by the Contractor - The contractor shall furnish the engineer reasonable facilities for obtaining such information as he may desire respecting the character of the materials and the progress and manner of the work (including all information necessary to determine its cost, such as the number of men employed, their pay, the time during which they worked on the various classes of construction, etc.)

23. - Restrictions on disposition of Plant, etc., - The contractor shall not make any disposition of the plant, machinery, tools, appliances, supplies, materials or animals used on or in connection with the work, either by sale, conveyance, or incumbrance, inconsistent with the special lien of the Board, expressly created by this contract.

24. - Damages - The contractor will be held responsible for and required to make good, at his own expense, all damages to person or property caused by carelessness or neglect on the part of the contractor, his agents or employes.

25 - Character of Workman - The contractor shall not allow his agents or employees to trespass on premises or lands in the vicinity of the work. None but skilled foremen and workmen shall be employed on work requiring special qualifications, and when required by the engineer the contractor shall discharge any person who commits trespass or is in the opinion of the Engineer disorderly, dangerous, insubordinate, incompetent or otherwise objectionable. Such discharge shall not be the basis of any claim for compensation or damages against the Board or any of its Officers. The provisions of paragraph 3103, Chapter I, Title 14, Revised Statutes of Arizona, 1913, regulating the hours of labor of employes of the State, and the provisions of Paragraph 3105 of said Chapter I of said Title 14 forbidding the employment of aliens on public work, shall apply to the work done under this contract and shall be enforced by the contractor.

26 - Staking Out Work - The work to be done will be staked out for the contractor, who shall provide such material and give such assistance as may be required by the engineer.

27 - Methods and Appliances - The methods and appliances adopted by the contractor shall be such as will, in the opinion of the engineer, secure a

satisfactory quality of work and will enable the contractor to complete the work in the time agreed upon. If at any time the methods and appliances appear inadequate, the engineer may order the contractor to improve their character or efficiency, and the contractor shall conform to such order; but failure of the engineer to order such improvement of methods or efficiency will not relieve the contractor from his obligation to perform satisfactory work and to finish it in the time agreed upon.

28 - Climatic Conditions - The engineer may order the contractor to suspend any work that may be damaged by climatic conditions. When delay is caused by an order to suspend work given on account of climatic conditions that could have been reasonably foreseen the contractor will not be entitled to any extension of time on account of such order.

29 - Removal and Rebuilding of Defective Work - The contractor shall remove or rebuild at his own expense any part of the work that has been improperly executed, even though it has been included in the monthly estimates. If he refuses or neglects to replace such defective work, it may be replaced by the Board at the contractor's expense.

30 - Protection of Work and Cleaning Up - The contractor shall be responsible for the care of all work until its completion and final acceptance, and he shall at his own expense replace damaged or lost material and repair damaged parts of the work, or the same may be done at his expense by the Board. He shall take all risks from floods and casualties and shall make no charge for delay from such causes. He may, however, be allowed a reasonable extension of time on account of such delay, if any, subject to the conditions hereinabove specified. The contractor shall remove from the vicinity of the completed work all plant, buildings, rubbish, unused material, concrete form, etc., belonging to him or used under his direction during construction, and in the event of his failure to do so the same may be removed by the board at his expense.

31 - Special Flood Protection - In addition to any other flood protection methods he may devise the contractor shall proceed with the construction of the retaining wall and shall build same complete to elevation 1610 or higher, and shall

build complete the wasteway channel before placing any embankment material between Station Three and Station Ten as shown on drawing No.2, and shall build such temporary dykes or turning works as are necessary to divert the flood waters which may occur during construction through wasteway channel. In making the wasteway excavation all necessary blasting therefor must be done before the pouring of any concrete in the retaining wall or concrete dam sections.

The by-pass shall be kept open until the embankment and spillway are completed. Work done in accordance with this paragraph will not relieve the contractor of responsibility for damage during construction as noted in paragraph 30.

32 - Bench marks and Survey Stakes - Bench marks and survey stakes shall be preserved by the contractor and in case of their destruction or removal by him or his employees, they will be replaced by the engineer at the contractor's expense.

33 Right of Way - The site for the installation of machinery or the right of way for the works to be constructed under this contract and for necessary borrow pits, channels, spoil banks, roads, etc., will be provided by the Board.

34 - Quantities and Unit Prices - The quantities noted in the schedule are approximations for comparing bids, and no claim shall be made against the Board for excess or deficiency therein, absolute or relative. Payment at the prices agreed upon will be made for the completed work and will cover all expenditures by the contractor incident to satisfactory compliance with the contract.

P R E A V I L S P E C I F I C A T I O N S

GENERAL PROVISIONS

35 - The Requirement - It is required that there be constructed and completed in accordance with these specifications and the drawings hereinbelow listed, an earth and reinforced concrete dam and spillway on Gava Creek about 18 miles North of the City of Phoenix, Arizona.

36 - List of Drawings -

- No. 1 - General map showing location of Reservoir.
- No. 2 - Topography at damsite and spillway.
- No. 3 - Dam sections and detail of scrowall and spillway wall.
- No. 4 - Details of retaining wall.
- No. 5 - Details of concrete section of dam.

37 - Commencement and Completion of Work - Work shall be commenced by the contractor within fifteen (15) days after notice of award of contract by the Board. The contractor shall at all times during the continuation of the contract, prosecute the work with such force and equipment as, in the judgment of the engineer are sufficient to complete the work within the contract time.

38 - Progress Estimates and Payments- At the end of each calendar month the engineer will make an approximate measurement of all work done and material delivered up to that date, classified according to the items in the contract, and will make an estimate of the value of the same on the basis of the unit prices named in the contract. To the estimates made as above set forth, will be added the amounts earned for extra work to the date of the progress estimate. From the total thus computed, a deduction of ten (10) per cent will be made and from the remainder there will be further deducted any amount due the Board from the contractor for supplies or material furnished or services rendered and any other accounts that may be due to the Board as damages for delays or otherwise under the terms of the contract. From the balance thus determined will be deducted the amount of all previous payments, and the remainder will be paid to the contractor upon the approval of the accounts by the Board. The percentage deducted as above set forth will become

due and payable to the contractor with and as a part of the final payment to be made as hereinafter provided. In case of the suspension of the contract, the said percentage shall be and become the sole and absolute property of the Board to the extent necessary to repay the Board any excess in the cost of the work above the contract price. When the terms of the contract shall have been fully complied with to the satisfaction of the engineer and the Board, and when a release of all ^{claims} ~~claims~~ against the Board under or by virtue of the contract shall have been executed by the contractor, final payment will be made of any balance due, including the percentage withheld as above set forth, or such portion thereof as may be due the contractor.

39 - Sub-contractors - No sub-contract shall be made by the contractor without the approval of the Board.

M A R T H W O R K

40 - Clearing and Grubbing - The ground under all embankments shall be cleared of trees, brush and vegetable matter of every kind. The roots shall be grubbed and removed with the other vegetable matter.

41 - Foundation of Main Embankment - The surface of the ground under the entire embankment (except where the surface is solid rock) shall be scored with a plow making open furrows parallel with the axis of the embankment not less than eight inches deep at intervals of not more than four feet.

(a) - Tight Fill - Where tight material is shown on plans the embankment shall be carried up in horizontal layers not exceeding five inches in thickness; every layer to be carefully rolled, with a roller weighing not less than 500 lbs. per inch run and to be wetted in a manner and amount satisfactory to the engineer. A layer as referred to in this paragraph shall consist of 80% gravel or coarse materials and 20 % of the clay silt or fine materials spread uniformly in horizontal layers over the entire surface. The ratio of clay silt or fine materials may be increased or decreased to an amount necessary in the opinion of the engineer, to properly fill the voids. This shall be thoroughly mixed by harrowing or discing to a depth sufficient to disturb and form a bond with the layer beneath. The earth to be well rammed with heavy rammers at such points as cannot be reached by the roller. Special care shall be required in ramming the earth close to the curwall and the

retaining wall.

(b) - Upstream Gravel Fill - The gravel portion of the embankment shall consist of gravel similar to that in the bed of Cave Creek at the damsite and shall be carried up at the same time as the tight fill and compacted with water.

(c) - Downstream Fill - The main portion of this fill as shown in the drawings shall consist of previous material consisting of sand, gravel and small loose rocks and boulders. This material shall be deposited in such a manner as to balance the thrust on the corewall from the upstream fill, and be watered sufficiently to thoroughly compact it.

The lower toe shall be composed of boulders and coarse material as indicated on the plans.

42 - Quality of Materials to be used in Main Embankment - The earth used for the tight portion of the embankment shall be free from perishable material of all kinds, and from stones larger than four inches in greatest dimension, and it shall be of a quality approved by the engineer. When suitable material cannot be obtained from any one borrow pit, it will be necessary to properly mix material from two or more pits until material satisfactory to the engineer is obtained. The engineer shall decide upon the quality of the earth to be used in all parts of the dam, and it must be selected and placed in accordance with his orders. Timber trestles may be used in the construction of the dam provided all lateral bracing is removed ahead of the filling.

43 - Finishing Embankments - The surfaces of the embankment shall be dressed smoothly to line and grade as given by the engineer. An allowance for shrinkage of 1- 1/2 - ft. in height on the downstream side of the corewall and of one foot on the upstream fall shall be made by the Engineer in setting the stakes so that when final settlement takes place the dam will conform as nearly as practicable to the top width, height and slopes shown in the drawings. Payment will be made to the contractor for embankment paydays including allowance for shrinkage as described above.

44 - Cut-Off Trench - A trench shall be excavated near the upstream toe of the dam at location indicated on the drawings. The trench shall be eight feet wide and shall be carried into impervious material. Near the abutments of the dam whar

rock or hard cemented material is close to the surface the trench shall be excavated six feet wide and four feet, more or less, in depth as directed by the engineer. This trench must be backfilled with wetted and tamped tight material similar to the tight material in the main embankment and thoroughly bonded into same. Excavation will be paid for on a cubic yard basis for a trench eight feet wide, the price per cubic yard depending on depth of trench as indicated in the schedule. Backfill will be paid for at the same price per cubic yard as for the tight material in main embankment.

45 - Excavation for Corewall - A trench shall be opened from the ground surface to and into the impervious stratum underlying the dam, of sufficient width to admit of the construction of a reinforced concrete corewall of the dimension shown on the plans at location indicated by the Engineer. Form will not be required where the trench walls will stand with vertical faces, but no payment will be made for concrete required in excess of the dimensions shown on the drawings. The space, if any, between the wall and the side of the trench shall be backfilled with selected tight material.

Payment for trench excavation will be made at the prices bid in the schedule. Backfill will be paid for at the same price per cubic yard as for tight material in main embankment.

46 - Spillway - The spillway will consist of an open cut 600 feet wide in a saddle about one mile east of the damsite. A concrete wall of dimensions shown on plans shall be constructed across the full width of the spillway, at location shown on plans.

47 - Bypass Channel - Near the Western end of the dam a cut 120 feet wide shall be excavated to lines and grades as given by the engineer. The object of this by-pass is to furnish a passage for flood waters during construction, and as a channel for water drawn from the reservoir after construction.

Material from this excavation may be used for riprap and for concrete, if satisfactory to the Engineer.

48 - Riprap - After the upstream slope of the embankment has been brought to grade it shall be surfaced at the option of the contractor either with a layer twelve inches in thickness of hand packed rock or with a two-foot layer of loose

spread boulders, the voids in which shall be filled with gravel. The hand packed rock used in the twelve-inch layer mentioned above shall be of a size, quality and workmanship satisfactory to the engineer.

CONCRETE

49 - Concrete Structures - All structures shall be carefully finished to the lines and dimensions shown on the drawings or prescribed by the engineer. The dimensions will be subject to the necessary changes to meet the conditions disclosed by the excavation.

50 - Excavation of Structures - Excavation for structures shall conform to the lines in the drawing or prescribed by the engineer.

Before any concrete is laid against any surface the surface shall be thoroughly wetted and freed from all dirt and other objectionable substances. Seams and cavities in the rock shall be cleaned out and filled with concrete, mortar, grout, well compacted into place.

51 - Cement - All cement shall be first quality Portland Cement and shall meet the requirements of the standard specifications and tests of the American Society for Testing Materials. It shall be furnished in the original packages bearing the original labels. A sack shall contain 94 pounds net, and this quantity of cement shall be considered as one cubic foot in the volumetric proportioning of concrete and mortar. The term "barrel", (of cement) shall refer to the equivalent of 4 sacks of 94 pounds of cement.

The cement shall be sampled for testing, either at the mill or on delivery at the damsite, as the engineer may prefer. The contractor shall keep on hand a sufficient quantity to insure that the work shall not be delayed while awaiting the result of the tests in cement. The cement shall be stored in such a manner as to permit easy access for proper inspection and identification of each shipment and in a suitable weather tight building (or bins) which will protect the cement from dampness. In all handling of cement from the time it is removed from the car to the time it is placed in the mixer, care shall be taken to protect it from dampness.

Wherever the contractor desires to place clean stones evenly distributed, thoroughly bedded and entirely surrounded by concrete, he may do so subject to the approval of the engineer.

The exact relative proportions to be used of fine and coarse aggregate to each other will be determined by the engineer from time to time by mechanical analysis of the aggregate and tests of samples of concrete.

The various ingredients of concrete, including the water, shall be measured separately by the contractor and the method of measurement shall be such as to secure the proper proportions at all times.

56 - Mixing - The ingredients of concrete or mortar shall be mixed in approved mechanical batch mixers unless permission is given to the contractor in writing to mix by hand. Water shall be used and in only sufficient quantity to produce a mixture of the consistency required. In general the mixture shall be only wet enough to permit the concrete to flow into place after being deposited as close as practicable to its final location. Drier mixtures shall be used when directed. Very wet or sloppy mixtures shall be used only when expressly ordered by the engineer. The mixing shall be thorough and shall be continued until all the ingredients are uniformly distributed throughout the mass. No retempering will be allowed. No concrete shall be used which has had time to attain initial set before being placed in the work. In transporting the mixed concrete and depositing it in place no method shall be used which might cause segregation of the ingredients.

57 - Placing Concrete - No concrete shall be placed in water except by written permission of the engineer and the method of depositing the same shall be subject to his approval. Foundation surfaces upon which concrete is to be placed must be free from mud and debris. When the placing of concrete is to be interrupted long enough for the concrete to take its final set, the working face shall be given a shape by the use of forms or other means, as directed by the engineer, that will secure proper union with subsequent work. "Dry" concrete shall be deposited in layers not exceeding six inches in thickness, each of which shall be rammed until water appears on the surface. "Wet" concrete shall be stirred with suitable tamping bars, shovels or forked tools until it completely fills the form, closes snugly against all surfaces and is in perfect and complete

52 - Sand or Fine Aggregate - The term "Sand" shall be understood to refer to natural river sand or to the fine aggregate obtained by screening or rolling crushed- crushed rock, or to the mixture of the two.

Sand for concrete and for mortar shall consist of sharp grains of hard sound stone. It shall not show a total of more than 5 per cent by volume of silt, clay or other undesirable material, after being shaken in water and allowed to settle. It shall contain fine and coarse particles in such proportion as will produce the most satisfactory results, as determined by mechanical analysis and by tests in the strength of samples of mortar and concrete.

The maximum size of particles shall be such as to pass a screen having four meshes per linear inch and not more than five per cent shall pass a screen having 100 meshes per linear inch. If the sand taken from the creek bed does not show the required characteristics the contractor shall, before using it in concrete, wash or screen it or mix fine crushed rock with it, so that the resulting sand shall be fully satisfactory.

53 - Broken Rock or Gravel - The broken rock or gravel for concrete must be hard, dense, durable rock fragments or pebbles that will pass through a two and one half inch ring, and that will be retained in a one-fourth inch clear mesh. Where in the opinion of the engineer it be considered necessary the contractor shall use no coarse aggregate which will not pass a one and one-half inch square mesh. The broken rock or gravel must be free from loam, clay and other undesirable material, and in all respects satisfactory to the engineer.

54 - Water - The water used in mixing concrete must be reasonably clean and free from objectionable quantities of organic matter, and other impurities. Water shall be used in proportions as directed by the engineer.

55 - Proportioning Concrete - A proportion of one to eight (i.e. one part of cement to eight parts of fine and coarse aggregate measured separately) shall be used for the spillway wall and the piers and cut-off wall of concrete dam, and the unreinforced portion of the cut-off wall.

A proportion of one to six (i.e. one part of cement to six parts of fine and coarse aggregate measured separately) shall be used for all other concrete work.

contact with any steel used for reinforcement. Where smooth surfaces are required, a special flat, square shovel or a suitable forked tool shall be worked up and down next to the form until the coarser material is forced back and a mortar layer is brought next to the form. No concrete shall be placed except in the presence of a duly authorized inspector.

58 - Finishing - The surface of concrete finished against forms must be smooth, free from projections and thoroughly filled with mortar. In case the surface of the concrete, upon removal of form, is found to be rough and irregular and not well filled with mortar, it shall be removed and a new concrete shall be placed either for its full thickness or for such part as the engineer may direct. Immediately upon the removal of form, all voids shall be neatly filled with 1:3 cement mortar, irregularities in exposed surfaces shall be removed and minor imperfections of finish shall be smoothed to the satisfaction of the engineer. Exposed surfaces of concrete not finished against forms, such as horizontal or sloping surfaces shall be brought to a uniform surface and worked with suitable tools to a smooth mortar finish. All exposed salient angles shall be rounded or beveled by the use of moulding strips or suitable moulding or finishing tools.

59 - Protection - The contractor shall protect all concrete against injury. Exposed surfaces of concrete shall be protected from the direct rays of the sun and shall be kept wet for at least two weeks after the concrete has been placed. Concrete laid in cold weather shall be protected from freezing and by such precautions as the engineer may approve. All damage to concrete shall be repaired by the contractor at his expense, in a manner satisfactory to the engineer.

60 - Joining New Work to Old - For the proper bonding of fresh concrete with that which has set or partially set, provision shall be made of steps, dovetails, rough surfaces, dowels of stone or other devices as directed. Whenever fresh concrete is to be deposited against concrete which has already set, the surface of the old concrete shall be thoroughly cleaned and free from laitance using a stiff brush and other tools if required and a stream of water under pressure. The surface shall be clean and wet at the time the fresh concrete is placed. If

directed, the old surface shall be covered with a layer of grout or mortar well worked into the surface and the fresh concrete shall be thoroughly worked against the grouted or mortared surface.

61 - Expansion Joints - Expansion Joints shall be constructed as shown on the drawings. To form an expansion joint the concrete on one side shall be poured against forms; after the removal of the forms the contact surface shall be covered with a one-half inch layer of elastite, or other satisfactory material, before pouring concrete on the other side of the joint. Payment for this work will be included in the price per cubic yard paid for the concrete.

62 - Special Expansion Joint - At the junction of the corewall with retaining wall a special expansion joint will be constructed as shown on drawings. It will require about 100 feet of one-inch galvanized iron pipe.

The asphalt blocks shall be cast from Standard Oil No. 50D asphaltum or equivalent and be set in place with the double line of piping before pouring the corewall concrete. The contact surfaces of retaining wall with corewall shall be painted with an approved asphaltic paint before pouring the corewall concrete.

Before acceptance this joint shall be tested by passing steam through the piping until the asphaltum shall be melted and adding a sufficient asphaltum to bring the level of same to top of the structure.

63 - Forms - Forms shall be substantial and unyielding and built so that the concrete shall conform to the designated dimensions and contours, and be constructed as to prevent leakage of mortar.

The lumber used for face work shall be dressed to a uniform thickness and width; shall be sound and free from loose knots and secured to the studding or wrights in horizontal lines.

For backing and other rough work undressed lumber may be used. Where corners and other projections liable to injury occur suitable molding shall be placed in the angles of the forms.

Lumber once used in forms shall be thoroughly cleaned before reusing. The forms shall not be removed until authorized by the engineer.

64 - Reinforcing Steel - Steel reinforcing bars shall be new, un-rusted steel, free from all mill scale, delivered without rust other than what

may have accumulated in prompt transportation to the work, and shall conform to the standard specifications for Billet Steel Reinforcing Bars adopted by the American Society for Testing Materials.

The bars called for on the drawing are square, with net sections equal to the squares of the nominal sizes. Round deformed bars having equal net sections may be substituted.

Reinforcing Steel shall be bent to shape and placed in exact position as shown in the drawing or as directed, and shall be securely wired together at all intersections and splices of bars. All the wire shall be soft black annealed wire No. 16 - W & M gauge for bars 5/8 inch or lighter and No. 14 W & M gauge for heavier bars.

The reinforcement shall be securely fastened in position in the forms to prevent its becoming displaced during the placing of the concrete. It shall at all times be thoroughly protected from moisture until covered with concrete. Any steel that is to be left projecting for a considerable time shall be painted with a heavy coat of cement grout. Any steel which shows rusty before the concrete is placed shall be satisfactorily cleaned.

In splicing reinforcement, rods shall be lapped not less than 40 diameters. No splices shall be made at points of maximum stress.

65 - Hand railing - The contractor shall furnish and place hand railing on downstream side of concrete walk as shown on plans. The galvanized pipe shall be of the best grade standard weight galvanized wrought iron or steel pipe provided wherever required with standard galvanized elbows, crosses, tees, flanges, plugs, and fastenings. In handling pipe and fittings, great care shall be taken to avoid injuring the zinc coating on any piece. Such injury shall be cause for the rejection of the piece.