

Los Angeles

DONALD R. WARREN CO.
Engineers

San Francisco

SPECIFICATIONS
FOR
MATILIJA DAM
VENTURA COUNTY FLOOD CONTROL DISTRICT
ZONE ONE
CALIFORNIA

JOB NO. LA 46-1



PSB000000245

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INDEX

SPECIFICATIONS FOR MATILIJA DAM

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SCHEDULE

ITEM NO.	WORK	QUANTITY & PRICE	AMOUNT
1	Diversion and Care of River and Unwatering Foundations	For the lump sum of:	
2	Excavation; Common, below 1000 feet Elevation	<u>12,000</u> Cu.Yds. @	
3	Excavation; Common, above 1000 feet Elevation	<u>25,000</u> Cu.Yds. @	
4	Excavation; Rock, below 1000 feet Elevation	<u>6,000</u> Cu.Yds. @	
5	Excavation; Rock, above 1000 feet Elevation	<u>18,000</u> Cu.Yds. @	
6	Drilling Grout Holes	<u>1,400</u> Feet @	
7	Pressure Grouting	<u>2,000</u> Cu.Ft. @	
8	Grouting Piping	<u>15,000</u> Pounds @	
9	Mass Concrete in Dam	<u>51,000</u> Cu.Yds. @	
10	Concrete in Parapets, Piers, and Bridge	<u>290</u> Cu.Yds. @	
11	Concrete in Downstream Apron and Valve House foundation	<u>2,200</u> Cu.Yds. @	
12	Copper Sealing Strips in Contraction Joints	<u>2,600</u> Lin.Ft. @	
13	Galvanized Sealing Strips in Contraction Joints	<u>2,600</u> Lin.Ft. @	
14	Reinforcement Steel in Dam, Piers, Bridge and Parapets	<u>120,000</u> Pounds @	
15	Vent Piping for Sluice Gates	<u>300</u> Lin.Ft. @	
16	Drainage System	<u>1,000</u> Lin.Ft. @	
17	Trash Rack and Stem Guide Frames	<u>44,000</u> Pounds @	
18	Installation of District-Furnished Valves, Sluice Gates and Appurtenances, and furnishing of Plaque	<u>\$10,000</u> to be allowed	
19	Piping (Water) including Flanges, Couplings, and Manhole	<u>32,000</u> Pounds @	

SCHEDULE

ITEM NO.	WORK	QUANTITY & PRICE	AMOUNT
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20 Valve House and Control House
(excluding Valve House Foundation For the lump sum of:

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SECTION 1

GENERAL CONDITIONS

1-01. Definitions. Wherever in the specifications or upon the drawings the words directed, required, permitted, ordered, designated, prescribed, or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the District's representative is intended; and similarly, the words approved, acceptable, satisfactory, or words of like import, shall mean approved by, acceptable to, or satisfactory to the District's representative, unless otherwise expressly stated. The following terms as used in this contract shall be defined and interpreted as follows:

(a) "Contract" or "this Contract". The particular contract executed by the contractor and the district of which these General Conditions are integral parts.

(b) "Contractor." The person, firm or corporation to whom this contract is awarded by the District and who is a party thereto.

(c) "District." The entity that is a party to this contract, contracting under the official name of Ventura County Flood Control District, Zone 1, or a properly authorized agent thereof.

(d) "Engineer" shall mean Donald R. Warren Co., or a properly authorized representative thereof.

(e) "Subcontractor." Any person, firm or corporation other than an employee of the contractor, supplying, for and under agreement either with the contractor or any subcontractor of the contractor, labor or materials, or both, at the site of the project in connection with this contract.

(f) "Project." The dam, control house, piping to control house, and appurtenances to be completed in whole through the performance of this contract.

(g) "Work on the Project." Such work as is performed or ordinarily would be performed at the site of the project.

(h) "Surety." Any firm or corporation executing a surety bond or bonds payable to the District, securing the performance of the contract either in whole or in part.

1-02. In Conflict of Provisions, the stipulations of the "General Conditions" take precedence over all other provisions of the contract unless they are specifically waived. All provisions in any other part of this contract which may be in conflict or inconsistent with any provision in the "General Conditions" shall be void to the extent of such conflict or inconsistency.

1-30. Claims of Contractor against the District

1-31. Payments to Contractor

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 - (1) Quantities at Unit Prices
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1-32. District's Right to Withhold Certain Amounts and
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1-03. Notice and Service Thereof. Any notice from one party to the other under the contract shall be in writing and shall be dated and signed by the party giving such notice or by a duly authorized representative of such party. Any such notice shall not be effective for any purpose whatsoever unless served in the following manner, namely: (a) if the notice is given to the District, by personal delivery thereof to the individual duly authorized to direct and supervise the project for the District; or by depositing the same in the United States mails, enclosed in a sealed envelope, addressed to the District for the attention of said individual, postage prepaid and registered; (b) if the notice is given to the contractor, by personal delivery thereof to said contractor or to his foreman at the site of the project, or by depositing the same in the United States mails, enclosed in a sealed envelope, addressed to the contractor at his regular place of business or at such other address as may have been established for the conduct of the work under this contract, postage prepaid and registered; or (c) if the notice is given to the surety or any other person, by personal delivery to such surety or other person, or by depositing the same in the United States mails, enclosed in a sealed envelope, addressed to such surety or other person, at the address of such surety or other person last communicated by him to the party giving the notice, postage prepaid and registered.

1-04. Commencement and Completion of Work. The Contractor will be required to commence work at the site within ten (10) calendar days after the award of the contract and to complete the entire work for use in accordance with the conditions set forth in the accepted bid with the time stated for completion to include the final clean-up of the premises resulting from construction operations.

1-05. Prosecution of Work. The Contractor shall at all times during the continuance of the contract prosecute the work with such force and equipment as in the judgment of the Engineer are sufficient to complete it within the time specified.

1-06. Liquidated Damages. Except where an extension of time is granted by the District, the Contractor shall pay to the District as fixed, agreed and liquidated damages the sum of Two Hundred Dollars (\$200) per day for each calendar day's delay until such time as the District may reasonably procure the completion of the work by another Contractor or complete the work itself. Whatever sums may be due as liquidated damages for delay may be deducted from payments *DUE TO*

1-04 (con't.) Date of completion of the work shall be on or before February 1, 1947, at which time final inspection shall be made by the Engineer preparatory to recommending acceptance of said work. Acceptance of said work will be made by the Board at the first regular meeting following the Engineer's inspection and their own inspection, both Engineer and Board having determined that said work is in strict accordance with the plans and specifications, drawings and included documents.

~~due to~~ the Contractor or may be collected from the Contractor or the Contractor's surety or sureties. The provision for liquidated damages shall not prevent the District from terminating the right of the Contractor to proceed in case of default.

1-07. Delays and Extension of Time. Only where delays are the result of any act or neglect of the District, the Engineer or separate Contractor employed by the District, and not due to any fault or neglect of the Contractor (as determined by the Engineer) will an extension of time be granted by the District. The Contractor shall immediately notify the Engineer of the conditions requiring his claim for extension of time. The length of extension where allowed shall be determined by the Engineer.

The District reserves the right of suspending the whole or any part of the work without compensation for loss to the Contractor for such suspension other than extending the time of completing the work as much as it may have been delayed (in the judgment of the Engineer) by the suspension.

1-08. Permits and Compliance with Law. The Contractor shall, at his expense, obtain all permits and licenses necessary for the performance of this contract, and give all necessary notices, pay all fees required by law, and comply with all laws, ordinances, rules and regulations governing the Contractor's performance of the contract, except as otherwise specified.

The services of a resident engineer and any required assistants will be provided by the District.

Plans and specifications for the work will be filed with the California State Division of Dams, and checking fee paid by the District.

1-09. Construction Schedule and Periodical Estimates. Immediately after execution and delivery of the contract, and before the first partial payment is made, the Contractor shall deliver to the District a construction progress schedule in form satisfactory to the District, showing the proposed dates of commencement and completion of each of the various subdivisions of work required under the Contract Documents and the anticipated amount of each monthly payment that will become due the Contractor in accordance with the progress schedule. The Contractor shall also furnish on forms to be supplied by the District (a) a detailed estimate giving a complete breakdown of the contract price and (b) periodical itemized estimates of work done for the purpose of making partial payments thereon. The values employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the contract price.

1-10. Materials, Services and Facilities. It is understood that except as otherwise specifically stated in the contract, the

Contractor shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, superintendence, temporary construction of every nature, and all other services and facilities of every nature whatsoever necessary to execute and complete the contract within the specified time.

1.11. Camp and Camp Site. Should the Contractor elect to build a camp, it shall be constructed, maintained, operated and removed by the Contractor in such manner as approved by the Engineer.

(a) Area for Use of Contractor. The Contractor shall confine his apparatus, storage of materials, and construction operations to a line 200-feet downstream from the proposed dam running parallel to the dam, and the top contour line of the surrounding hills.

(b) Regulations. The Contractor shall enforce any instructions of the District regarding signs, advertising, fires, danger signals, barricades, and smoking, and shall require all persons employed on the work to comply with all regulations while on the site.

(c) Office. The Contractor shall, at the beginning of the work, put up a suitable temporary office not less than 10 ft. x 12 ft. in size and shall light, heat and take care of same. He shall provide in office one work table along one side of office with drawer for use of Engineer and also provide suitable racks for holding drawings.

(d) Telephone. The Contractor shall have a telephone placed in the office for the use of the engineer. This telephone is to remain until completion of the work and is to be paid for by the District.

(e) Sanitary Arrangements. The Contractor shall, at the beginning of the work, build toilet sheds adequate for the required use at a location acceptable to the Engineer.

The Contractor shall install temporary fixtures in the building and shall build temporary partitions around the same.

(f) Temporary Enclosures. The Contractor shall provide all barricades, guards, or such other protection around the work as required. The Contractor is to provide all required artificial lighting in connection with such guards at his own expense. All temporary enclosures shall be promptly removed on completion of the work. No signs of any kind or description will be allowed anywhere on these temporary enclosures without the consent of the District or Engineer.

(g) Drinking Water in sufficient quantities for the required use, and of a quality acceptable to the Engineer, shall be furnished by the Contractor.

(h) Electric Power shall be provided by the Contractor for all necessary construction purposes.

(i) Removal of temporary site structures shall be ~~done~~ *made* by the Contractor upon completion of the work.

1-12. Care and Maintenance of Public Roads. The Contractor shall take all necessary care and precautions to prevent injury and traffic impairment to public roads in the County of Ventura due to his use of them for construction purposes, as approved by the Engineer. Where in the judgment of the Engineer any County road is injured due to neglect or carelessness of the Contractor, the Contractor shall make approved repairs at his own expense. Traffic shall be kept open on the County road leading to the site until such time as construction actually causes blockage. The Contractor shall notify District thirty (30) days in advance of date necessary to close road to traffic (to permit District to effect necessary rerouting of traffic.)

1-13. Labor.

(a) Character of Workmen. The Contractor shall employ only orderly, competent and skillful men to do the work. Where informed by the Engineer that any man or men are in his opinion incompetent, unfaithful or disorderly, such man or men shall be discharged from the work and shall not be re-employed on the same job without the Engineer's approval.

(b) Local Labor Preference. Contractor shall hire workmen living in Ventura County, California, wherever possible. Only where workmen of the proper qualifications cannot be secured will non-resident workmen be allowed on the job.

(c) Wage Rates on this project shall be not less than minimum wages to be paid laborers and mechanics as given *Section 1770 of California Labor Code and shall be in accordance with all other Federal and State laws.*

in the invitation to bid.
(d) Overtime. Any work necessary to be performed after regular working hours, on Sundays or legal holidays, shall be performed without additional expense to the District.

1-14. Reservation and Compliance with Specifications of Materials or Equal. The Contractor shall reserve the required materials for delivery when needed; and within ten (10) days after acceptance of the contract, shall send written notification of material reservation or request for approval of an "or equal" material to the Engineer. Written notification of reservation of "or equal" material shall be sent to the Engineer within five (5) days of approval.

Unless otherwise specifically provided in the specifications, all workmanship, equipment, materials, and articles incorporated in the work covered by this contract are to be new and of the best available grade of their respective kinds. Whenever in the specifications any material, article, device, produce, fixture, form, type of construction, or process is indicated or specified by patent or proprietary name, by name of the manufacturer, or by

catalog number, such specifications shall be deemed to be used for the purpose of establishing a standard of quality and facilitating the description of the material or process desired, and shall be deemed to be followed by the words, "or equal," and the Contractor in such cases may, at his option, use any item, type or process which shall be substantially equal in every respect to that so indicated or specified. The Engineer shall be the sole judge as to the equality of the substituted article.

Items of work for which a specific lump sum bid is provided shall not be allowed substitutions.

1-15. Warranty of Title. No material, supplies, or equipment for the work under this contract shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by the seller or supplier. The Contractor warrants good title to all material, supplies and equipment installed or incorporated in the work and agrees upon completion of all work to deliver the project, together with all appurtenances constructed or placed thereon by him, to the District free from any claims, liens, or charges and further agrees that neither he nor any person, firm, or corporation furnishing any materials or labor for any work covered by this contract shall have any right to a lien upon the project or any appurtenance thereon, provided that this shall not preclude the Contractor from installing metering devices and other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the City. In the event of the installation of any such metering device or equipment, the Contractor shall advise the District as to the Owner thereof. Nothing contained in this section, however, shall defeat or impair the right of such persons furnishing materials or labor under any bond given by the Contractor for their protection or any rights under any law permitting such persons to look to funds due the Contractor in the hands of the District. The provisions of this section shall be inserted in all subcontracts and material contracts and notice of its provisions shall be given to all persons furnishing materials for the work when no formal contract is entered into for such materials.

1-16. Inspection by District. The District and its representatives shall at all times have access to all parts of the work and to the shops wherein the work is in preparation for the purpose of inspection, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.

The District shall have the right to reject materials and workmanship which are defective, or to require their correction. Rejected workmanship shall be satisfactorily corrected, and rejected materials shall be removed from the premises without charge to the District. If the Contractor does not correct such rejected work within a reasonable time, fixed by written notice, the District may correct same and charge the expense to the Contractor.

Should it be considered necessary or advisable by the District at any time before final acceptance of the entire work to make an examination of work already completed by removing or tearing out any portion thereof, the Contractor shall on request promptly furnish all necessary facilities, labor, and materials. If such work is found to be defective in any respect due to the fault of the Contractor or his subcontractor, he shall defray all the expenses of such examinations and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the additional cost of labor and materials necessarily involved in such examination and replacement, plus fifteen (15) per cent for overhead and profit, shall be allowed the Contractor.

Where the specifications require work to be specifically tested or approved, it shall not be tested or covered up without timely notice to the District of its readiness for inspection and without the approval or consent thereto by the District. Should any such work be covered up without such notice, approval or consent, it must, if required by the District, be uncovered for examination at the Contractor's expense.

1-17. Tests. The cost of any inspection and tests of materials made by or at the request of the District other than specifically called for in these specifications shall be borne by the District, otherwise the cost of all inspections and tests required shall be borne by the Contractor.

Where such inspection and testing are to be conducted by an independent laboratory or agency, the sample or samples of materials to be tested shall be selected by such laboratory or agency, or the Engineer, and not by the Contractor.

1-18. Conduct of Work by Contractor. The Contractor shall be responsible for all damages to persons or property that occur as a result of his fault or negligence in connection with the prosecution of the contract and shall be responsible for the proper care and protection of all materials delivered and work performed until completion, and final acceptance by the District.

(a) Protection against Weather. The Contractor shall provide such heat, covering and enclosure as necessary to protect all work and materials against damage by weather conditions.

(b) Protection and Maintenance of Public and/or Private Property. The Contractor shall take adequate precautions to protect existing pavements, utilities, adjoining property and structures, and to avoid damage thereto, and he shall at his own expense completely repair any damage thereto caused by his operations.

(c) Accident Prevention. Precaution shall be exercised at all times for the protection of persons and property. The safety provisions of applicable laws, building and construction codes shall be observed. Equipment and other hazards shall be

guarded in accordance with the safety provisions of the "Manual of Accident Prevention in Construction," published by the Associated General Contractors of America, to the extent that such provisions are not in contravention of applicable law.

(d) In an Emergency Affecting the Safety of Life or Property, the Contractor, without special instruction or authorization from the District, is authorized to act at his discretion to prevent such threatened loss or injury; and he shall so act as if instructed to do so by the District.

(e) Superintendence by Contractor. The Contractor shall give his personal superintendence to the work or have a competent superintendent or foreman on the work at all times during progress with authority to act for him.

(f) Lines and Grades. Subject to the approval of the Engineer, the Contractor shall lay out his own work and he shall be responsible for all lines, elevations, and measurements of the dam, valve and control houses executed by him under the contract except that: The Engineer will make initial survey for excavation quantities, establish the reference points from which the Contractor will work, and make all measurements and computations for payment. The Contractor shall exercise proper precaution to verify the figures shown on the drawings before laying out the work and will be held responsible for any error resulting from his failure to exercise such precaution.

(g) Removal of Debris, Cleaning, Etc. The Contractor shall, as directed by the District during the progress of the work, remove and properly dispose of the resultant dirt and debris, and keep the site reasonably clear. Upon completion of the work he shall remove all equipment and unused materials provided for the work, and put the site in a neat and clean condition, and do all other cleaning and washing required by the specifications.

1-19. Contract Security. The Contractor shall furnish a surety bond in an amount equal to fifty per cent (50%) of the contract price as security for the faithful performance of this contract, and shall furnish a separate bond in an amount equal to fifty per cent (50%) of the contract price as security for the payment of all persons performing labor and furnishing materials in connection with this contract. The aforesaid bond or bonds shall be in form satisfactory to the District.

1-20. Insurance. In the event the form of any policy or certificate, or the amount of the insurance or the companies writing same are not satisfactory to the District, the Contractor shall furnish other policies or certificates in form and amount, and with companies satisfactory to the District. The Contractor shall not cause any policy to be cancelled or permit it to lapse, and all policies shall include a clause to the effect that the policy or certificate shall not be subject to cancellation or a reduction in the required limits of liability or amounts of insurance until notice has been mailed to the District stating when, not less than ten (10) days thereafter, such cancellation or reduction shall be effective. All certificates of insurance, authenticated by the proper officer of the insurer, shall state in particular

those insured, the extent of the insurance, the location and operations to which the insurance applies, the expiration date, and the above-mentioned notice of cancellation clause.

(a) Protection for Workmen. In addition to such other insurance that may be required under this contract, the Contractor shall provide adequate workmen's compensation insurance for all employees employed under this contract on the project who may come within the protection of workmen's compensation laws and shall provide, where practicable, employers' general liability insurance for the benefit of his employees not protected by such compensation laws, and proof of such insurance satisfactory to the District shall be given.

The Contractor will be charged with the responsibility for proper and adequate workmen's compensation coverage for all his subcontract operations, and in the event the Contractor's insurance does not cover each and every subcontractor, certificates of insurance issued on policies by companies that may be acceptable to the District covering each and every subcontractor shall be filed with the District prior to the commencement of such subcontract operations.

(b) Approval of Insurance Companies. All insurance required to be carried under this contract shall be written with such company as may be acceptable to the District. Satisfactory certificates of said insurance shall be filed with the District in triplicate prior to the commencement of operations by the Contractor.

(c) The Contractor as Self-Insurer. If the Contractor fully satisfies the District of his responsibility and capacity under the applicable workmen's compensation laws, if any, to act as self-insurer, he may so act, and in such case the insurance required by paragraph (a) of this section need not be provided.

(d) Public Liability Insurance. The Contractor shall take out, maintain, and pay for, during the performance of his work, public liability insurance covering all claims of damage or injury which may arise out of the performance of the contract. This policy will be for the protection of the Contractor and subcontractors and contingent liability to protect the District and will be in the amounts of Twenty-five Thousand Dollars (\$25,000.00) for one (1) person or one (1) accident, and Fifty Thousand Dollars (\$50,000.00) for more than one (1) person or one (1) accident. *500,000.00*

(e) Fire Insurance. The Contractor shall effect and maintain fire insurance with extended coverage indorsement upon the entire project on which the work of this contract is to be done to one hundred per cent (100%) of the insurable value thereof, including items of labor and materials connected therewith whether in or adjacent to the work insured, materials in place or to be used as part of the permanent construction

including surplus materials, shanties, protective fences, or temporary structures, miscellaneous materials and supplies incident to the work, and such scaffoldings, stagings, forms, and equipment as are not owned but rented by the Contractor, the cost of which is included in the cost of the work.

1-21. General Guarantee. Neither the final certificate of payment nor any provision in the contract nor partial or entire use of the project by the District shall constitute an acceptance of work not done in accordance with the contract or relieve the Contractor of liability in respect to any express warranties or responsibility for faulty materials or workmanship. The Contractor shall remedy any defects in the work and pay for any damage to other work resulting therefrom which shall appear within a period of one (1) year from the date of final acceptance of the work, unless a longer period is specified. The District will give notice of observed defects with reasonable promptness.

1-22. Assignment of Contract. The Contractor shall not assign this contract or any part thereof, nor any moneys due or to become due thereunder without the prior written consent of the District. No assignment of this contract shall be valid unless it shall contain provision that the funds to be paid to the assignee under the assignment are subject to a prior lien for services rendered or material supplied for performance of the work called for under this contract in favor of all persons, firms, or corporations rendering such services or supplying such materials.

1-23. Subcontractors. The Contractor shall not subcontract any work to be performed or any materials to be furnished in the performance of this contract without the prior written consent of the District. At least seventy (70) percent of the contract work shall be done by the Contractor's own organization (not more than thirty (30) percent of the contract work may be subcontracted).

(a) Specialty Subcontractors shall be utilized for the performance of such parts of the work under this contract as, under normal contract practices, are performed by specialty subcontractors, unless the District determines that the Contractor has heretofore customarily performed such specialty work with his own organization and is equipped to do so, or unless the District determines that performance of the specialty work by specialty subcontractors will result in increased costs or inordinate delays.

(b) Responsibility of Contractor for Subcontracted Work. If the Contractor shall subcontract any part of this contract, the Contractor shall be as fully responsible to the District for the acts and omissions of his subcontractor and of the persons either directly or indirectly employed by the subcontractor as he is for the acts and omissions of persons directly employed by himself. Nothing contained in this contract shall create any contractual relation between any subcontractor and the District. The District's consent to or approval of any subcontract under this contract shall not in any way relieve the Contractor of his obligations under this contract and no such consent or approval shall be deemed to waive any provision of this contract.

1-24. Mutual Responsibility of Contractors. If, through acts of neglect on the part of the Contractor, any other contractor or any subcontractor of any other contractor shall suffer loss or damage on the work, the Contractor agrees to settle with such other contractor or subcontractor by agreement or arbitration; if such other or subcontractor shall assert any claim against the District on account of any damage alleged to have been so sustained, the District shall notify the Contractor, who shall indemnify and save harmless the District against any such claim.

The Contractor must ascertain to his own satisfaction the scope of the project and the nature of any other contracts that have been or may be awarded by the District in the prosecution of the project to the end that the Contractor may perform this contract in the light of such other contracts, if any. Nothing herein contained shall be interpreted as granting to the Contractor exclusive occupancy of the site of the project. The Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the project. If the performance of any contract for the project is likely to be interfered with by the simultaneous execution of some other contract or contracts, the District shall decide which contractor shall cease work temporarily and which contractor shall continue, or whether the work under the contracts can be coordinated so that the contractors may proceed simultaneously. The District shall not be responsible for any damages suffered or extra costs incurred by the Contractor, resulting directly or indirectly from the award or performance or attempted performance of any other contract or contracts on the project, or caused by any decision or omission of the District respecting the order of precedence in the performance of contracts.

1-25. Patents. The Contractor shall hold and save the District and its officers, agents, servants, and employees harmless from liability of any nature or kind, including all costs and legal expenses, for, or on account of, any patented or unpatented invention, process, article, or appliance manufactured for or used in the performance of the contract, including its use by the District, unless otherwise specifically stipulated in the contract.

1-26. Other Contracts. The District reserves the right to let other contracts in connection with this work, and the Contractor shall fully cooperate with such other contractors and carefully fit his own work to that provided under other contracts. The Contractor shall not commit or permit any act which will interfere with the performance of work by any other contractors.

1-27. Right to Retain Imperfect Work. Where any part or portion of the work executed under this contract shall prove to be below the requirements as specified on the drawing and/or in the specifications, or as ordered by the Engineer; and where the imperfections are not of sufficient magnitude or importance to

warrant removal or where removal would create dangerous or undesirable conditions, the Engineer will have the right and authority to retain such work. In such case, deductions in the final payment which are just and reasonable in the judgment of the Engineer will be made.

1-28. Right of Engineer to Modify Methods and Equipment may be exercised where safety provisions, the quality and/or rate of progress of the work, are considered below requirements in the judgment of the Engineer.

1-29. Termination for Breach, etc. If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with such diligence as will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within such time, or if the Contractor should be adjudged a bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of the Contractor's insolvency, or if he or any of his subcontractors should violate any of the provisions of this contract, the District may serve written notice upon him and his surety of its intention to terminate this contract, such notice to contain the reasons for such intention to terminate this contract, and, unless within ten (10) days after serving of such notice, such violation shall cease and satisfactory arrangements for the correction thereof be made, this contract shall, upon the expiration of said ten (10) days, cease and terminate. In the event of any such termination the District shall immediately serve written notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract, provided, however, that if the surety within fifteen (15) days after the serving upon it of notice of termination does not perform the contract or does not commence performance thereof within thirty (30) days from the date of the serving of such notice, the District may take over the work under the contract and prosecute the same to completion by contract or by any other method it may deem advisable, for the account and at the expense of the Contractor, and his surety shall be liable to the District for any excess cost or other damages occasioned the District thereby, and in such event the District may, without liability for so doing, take possession of and utilize in completing the contract, such materials, appliances, plant and other property belonging to the Contractor as may be on the site of the project and necessary therefor.

The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the District.

1-30. Claims of Contractor against the District. If the Contractor should claim that any instruction, request, drawing, specification, action, condition, omission, default, or other situation obligates or may obligate the District to pay additional compensation to the Contractor or to grant an extension of time for the completion of the contract, or constitutes a

waiver of any provision in the contract, he shall notify the District in writing of such claim within ten (10) days from the date he has actual or constructive notice of the factual basis supporting the claim. The Contractor's failure to notify the District within such ten (10) day period shall be deemed a waiver and relinquishment of any such claim against the District. If such notice be given in apt time, the procedure for its consideration shall be as stated above in this Section.

1-31. Payments to Contractor. The making of any payment to the Contractor under this contract shall not relieve the Contractor of his obligations hereunder. The Contractor is obligated to complete the contract in its entirety and to deliver to the District such completed work, finished product or structure as is specified in the contract, and until this contract is fully performed by the Contractor and the work produced thereby is accepted by the District, the Contractor shall be obligated to repair, replace, restore or rebuild any fully or partially completed work or structure, or any materials or equipment required to be provided under the contract which may be damaged, lost, stolen or otherwise injured in any way.

(a) Payment for "Unit Price" work shall be computed on the basis of work done to neat lines where such lines are shown on the drawings or directed by the Engineer. Where payment is computed by other measures, the District, not later than the 15th day of each calendar month, will make a partial payment to the Contractor on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month under this contract. To insure the proper performance of this contract, the District will retain, except as otherwise specified in this "Section", ten per cent (10%) of the amount of each estimate until final completion and acceptance of all work covered by this contract. The District, at any time after fifty per cent (50%) of the work has been completed (if it finds that satisfactory progress is being made), may make any of the remaining partial payments in full. In preparing estimates, the material delivered on the site and preparatory work done may be taken into consideration.

(1) Quantities at Unit Prices. The quantities noted in the schedules are approximations for comparing bids. No claim shall be made against the District for excess or deficiency therein, actual or relative.

(b) Payment for Work Covered by Lump Sum Bid. The Contractor shall under the lump sum contract price furnish and pay for all labor, materials, equipment; and perform all work permanent and incidental thereto; and do everything which may be necessary to carry out the contract in good faith, complete, with good materials and workmanship, and in good working order.

(c) Payment for Extra, Additional or Omitted Work. The District, upon proper action by its governing body, may require

changes in this contract, or additions to, or deduction from the work to be performed or the materials to be furnished pursuant to this contract. No employee, agent or representative of the District, with the exception of the governing body authorized to award this contract, has any power to approve any change in this contract, and it is the responsibility of the Contractor before proceeding with any change to satisfy himself that the change has been properly authorized in behalf of the District. No charge for any extra work or any other change in the contract will be allowed unless the extra work or change has been authorized in writing by the District, and the price therefor is stated in such written authority.

Adjustments, if any, in the amounts to be paid to the Contractor by reason of any such change, addition, or deduction, shall be determined by one or more of the following methods:

(1) By an acceptable lump sum proposal from the Contractor.

(2) By a cost method pursuant to which the Contractor shall be paid the cost of the change or addition. He shall be required to keep and present in such form as the District may direct a correct account of the cost of the change or addition, together with all vouchers therefor. The cost may include an allowance for overhead and profit not to exceed fifteen per cent (15%) of the net cost.

In computing the cost, there shall be considered reasonable and proper net expenditures for labor, materials, power tools and equipment, pro rate charges for foremen, deductions for security, old age and unemployment benefits and workmen's compensation insurance and surety bond premium. No overhead and profit shall be allowed on the deductions for social security, old age and unemployment benefits. All other expenditures shall be treated as overhead costs.

The Contractor shall, when required by the District, furnish an itemized breakdown of the quantities and prices used in computing the value of any change, addition or deduction that might be ordered.

1-32. District's Right to Withhold Certain Amounts and Take Application Thereof. In addition to the amount which the District may otherwise retain under the contract, the District may withhold a sufficient amount or amounts of any payment or payments otherwise due to the Contractor, as in its judgment may be necessary to cover:

(a) Payments which may be past due and payable for just claims against the Contractor or any subcontractor for labor or materials furnished for the performance of this contract.

(b) Defective work not remedied.

(c) Failure of the Contractor to make proper payments to his subcontractors.

The District in its discretion may apply such withheld amount or amounts to the payment of such claims. In so doing, the District shall be deemed the agent of the Contractor, and any payment so made by the District shall be considered as a payment made under the contract by the District to the Contractor, and the District shall not be liable to the Contractor for such payment made in good faith. Such payment may be made without prior judicial determination of the claim or claims. The District will render to the Contractor a proper accounting of such funds disbursed in behalf of the Contractor.

1-33. Payments by Contractor. The Contractor shall pay:

(a) For all transportation and utility services not later than the 20th day of the calendar month following that in which such services are rendered.

(b) For all materials, tools, and other expendable equipment to the extent of ninety per cent (90%) of the cost thereof, not later than the 29th day of the calendar month following that in which such materials, tools, and equipment are delivered at the site of the project, and the balance of the cost thereof not later than the 30th day following the completion of that part of the work in or on which such materials, tools, and equipment are incorporated or used.

1-34. Shop Drawings Furnished by Contractor. Two (2) copies of all shop drawings of fabricated work shall be submitted for approval to the Engineer. These drawings shall be complete and shall contain all required detail information. If approved by the Engineer, each copy of the drawing will be identified as having received such approval by being so stamped and dated. The Contractor shall make any corrections required by the Engineer, file with him two (2) corrected copies and furnish such other copies as may be needed. The approval of the drawings by the Engineer shall not be construed as a complete check but will indicate only that the general method of construction and detailing is satisfactory. Approval of such drawings will not relieve the Contractor of the responsibility for any error which may exist as the Contractor shall be responsible for the dimensions and design of adequate connections, details, and satisfactory construction of all work. Descriptive data pertinent to materials, equipment, and accessories for which approvals are required, shall be submitted with the shop drawings. No material or equipment for which shop drawings are required shall be furnished, and no appurtenant work shall be performed until approvals of the drawings are received.

SECTION 2

SPECIAL CONDITIONS

2-01. Location. The site of the work is on the Matilija Creek approximately one thousand (1000) feet above Matilija Hot Springs Resort, and sixteen (16) miles north of San Buenaventura, Ventura County, California.

2-02. Scope. The work covered by these specifications includes the furnishing of all labor and materials, and performing all operations necessary to construct the "Matilija Dam" project. The work consists of:

- (a) Care of Matilija Creek during construction and unwatering of foundations.
- (b) The dam and appurtenances, and downstream apron.
- (c) The Control House and appurtenances.
- (d) The Valve House and appurtenances.
- (e) Piping up to Valve House outlets.

2-03. Care of Creek during Construction. The creek will be allowed to pass through the work by deflecting it toward the abutments so that the center concrete may be placed, and then bringing it to the center of the bed where it will pass through the sluice gate, permitting the concrete to be placed at the sides.

2-04. The Dam will be a single-arch concrete type, approximately 620-feet in length at the crest and approximately 168-feet in height from the lowest point of the foundation to the crest, with a gravity section at each abutment. A cut-off trench will be excavated in the foundation rock at gravity sections. The foundations and abutment rock will be drilled and pressure grouted. To allow for expansion and contraction, the concrete will be built up in sections approximately forty (40) feet long by five (5) feet high through the dam. The vertical joints between these sections will be sealed with copper expansion strips on the upstream side and galvanized iron strips on the downstream side. A concrete foot bridge will be mounted on concrete piers above the crest. A trash rack and power-operated sluice gate will be provided at the water outlet opening. A power-operated emergency sluice gate will be located at bottom center of dam. A concrete apron provided with a drainage system will be laid on exposed rock below the overpour section of the dam.

2-05. Piping extending from the outlet in the dam to the valve house will be supported above ground on concrete cradles spaced to prevent excessive deflection and will be provided for expansion.

2-06. Valve and Control Houses.

(a) Valve House will be of concrete construction and located two hundred (200) feet downstream from the dam. It will house the following:

- (1) A motor-operated gate valve on main conduit.
- (2) By-pass to stream with motor-operated gate valves.

(b) Control House will be of concrete construction located at the left abutment of the dam and shall house the equipment for remote control of the valves and gates.

Lump sum payment bid in the schedule for "Valve and Control Houses" will include the cost of the structures and architectural details, but will not include electrical or mechanical details which shall be paid for as provided in the "General Conditions" for "Payment for Extra, Additional or Omitted Work." Note

2-07. District-Furnished Items. The District shall furnish the sluice gates, gate valves and all auxiliary control mechanism. Note

2-08. Records and Reports. Daily discharge and maximum flood records are obtainable at the Los Angeles Office of the U. S. Geological Survey. Following are salient hydrologic data from office of the Engineer.

Average monthly run-off	2,400 Acre Feet
Minimum " " "	31 " "
Maximum " " "	48,170 " "
Maximum observed discharge March 2, 1938	15,900 Second Feet
Mean annual rainfall	34 Inches
Drainage area above dam	55 Square Miles

Further data on lesser floods and their frequency may be obtained from the U. S. Geological Survey.

2-09. Drawings and Specifications Furnished to Contractor.

(a) Interpretation. In general, the drawings will show dimensions, position, and kind of construction, and the specifications, qualities and methods; but minor modifications may be made in the full size details. Any work called for on the drawings and not mentioned in the specification, or vice versa, shall be furnished as though fully set forth in both. Work not particularly detailed, marked, or specified, shall be the same as similar parts that are detailed, marked or specified. Design drawings included in contract documents may be incomplete as to

dimensional detail, due to the absence of specific information on materials and/or equipment either owner or contractor furnished, or due to uncertainties of field conditions; these drawings will be revised or additional details issued as the work progresses, and as final information is developed. Where these revisions or additional details affect the scope or cost of the work, they will be considered as changes in the work, covered by the pertinent specification paragraphs. The District and/or the Engineer will be in no way hereby obligated to perform any design, detail, or layout work otherwise required of the Contractor.

(b) Errors and Discrepancies. Prior to execution of the work, the Contractor shall check all drawings and specification, and shall immediately report all errors, discrepancies, and omissions discovered therein to the District's representative. All such errors, discrepancies and omissions will be adjusted by the District's representative. Any adjustments made by the Contractor, without prior approval, shall be at his own risk, and the settlement of any complications arising from such adjustment shall be made by the Contractor at his own expense. This includes typographical errors in the specification, and notational errors on the drawings where doubtful of interpretation.

(c) Furnishing Drawings and Specifications. Five (5) sets of drawings and specifications will be furnished to the Contractor without charge. Additional sets will be furnished upon request at the cost of reproduction. All drawings and specifications are the property of the District and are to be carefully used and returned to the District at the completion or cessation of the work or termination of the contract, and are not to be used on other work.

(d) Completeness. It is the intent of the drawings and specifications that the Contractor shall turn over to the Owner a complete job. Any work not specifically called for or specified, but necessary to comply with the intent of quality and completeness shall be performed as a part of the contract under the pertinent conditions of payment.

(e) Issue of Specifications referenced shall be the latest revised or amended specifications to date.

(f) Drawings. The work shall conform to the following drawings, all of which form a part of these specifications and are entitled "Matilija Dam", Ventura County Flood Control District, Zone 1, California.

<u>Drawing No.</u>	<u>Designation</u>
H1	Matilija Reservoir Topography
S1	Geometric Layout of Arches
S2	Longitudinal Profile

Drawing No.Designation

S3	Cross Sections
S4	" "
S5	Piers and Crest Bridge
S6	Outlet and Trash Rack
S7	Sluice Gate Arrangement
S8	Thrust Blocks & Gravity Sections
S9	Valve and Control Houses
T1	General Plan
T2	Topography of Dam Site
E1	Electrical Plan and Details
M1	Valve Arrangement

SECTION 3

DIVERSION AND CARE OF CREEK AND UNWATERING OF FOUNDATIONS

3-01. Scope. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations in connection with installing, constructing and maintaining all diversion and protective works, the removal or leveling (as required) of same, diverting the creek, and maintaining each part of the work free from water as required.

3-02. Diversion of Creek. It is contemplated that the creek will first be diverted toward the dam abutments to permit the placing of the center dam sections and apron concrete. After the center sections are placed over the level of the emergency sluice gate, the creek will then be diverted so as to flow through the sluice gate allowing the side sections to be placed on properly unwatered foundations.

3-03. Care of the Creek. If the volume of water becomes too great to be passed through the sluice gate, additional diversion measures shall be taken as required. The requirements for passing flood waters will be dependent on construction schedule. Provisions for this purpose will be subject to the approval of the Engineer.

3-04. Alternate procedures for diverting and caring for the stream may be submitted to the Engineer for approval.

3-05. Unwatering of Foundations shall be accomplished by methods subject to the approval of the Engineer. Open drains in the surface of the foundations will not be allowed at areas where concrete is being placed. The maximum permissible level of water from the surface during the placing of concrete for the dam and downstream apron shall be two (2) feet.

3-06. Protection of dam. The Contractor shall be responsible for and shall repair at his own expense any damage to the dam and appurtenances caused by floods, water, or failure of any part of the diversion or protective works. This responsibility of the Contractor for the dam shall be in effect until the final acceptance of the dam by the District.

3-07. Removal of temporary diversion and protective works. The Contractor shall remove temporary diversion and protective works from the creek bed in a manner to be approved by the Engineer. Downstream from the dam, materials of diversion and protective works, where judged by the Engineer as not interfering in any way with the operation or usefulness of any part of the dam, nor providing an unsightly appearance, may be leveled instead of removed. Materials, where removed, shall be placed only in approved locations.

3-08. Payment for all work covered in this paragraph will be to the amount of the lump sum bid in the schedule.

No progress payment will be made for this work until all construction work below an elevation of 980-feet is completed and the temporary diversion and/or protective works have been removed or leveled to the satisfaction of the Engineer. Then fifty percent (50%) of the lump sum price will be paid. The balance will be included in the final payment under the contract.

SECTION 4

EARTHWORK

4-01. Scope. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations in connection with earthwork as indicated on the drawings and as specified herein.

Work to be done includes: the

Foundations and abutments of dam
Foundations of controlhouse
Foundations of valve house
Downstream channel bed

4-02. Definitions.

(a) Rock Excavation is defined as: All solid rock which cannot be removed until loosened by barring, wedging or blasting. Solid rock as distinguished from soft or disintegrated rock under common excavation which also requires blasting before removal is defined as sound rock of such hardness and texture that it cannot be loosened or broken down by hand drifting pins.

(b) Common Excavation is defined as all material to be excavated other than above.

4-03. Excavation. The Contractor shall perform all excavations to the lines and grades as specified and shown or as requested by the Engineer.

(a) Excavations for Foundations of dam and its abutments shall be made to sufficient depth to secure foundation on sound ledge rock free from open seams or other objectionable defects. Where excavation will not be covered with concrete, sharp points of undisturbed ledge rock may extend a maximum of one-half (1/2) foot within the required lines.

(b) Excavation for walls, slabs, and floors. Where concrete in walls, slabs, and floors is to be placed upon or against rock, the excavation shall be sufficient to provide the minimum thickness of concrete at all points, and the average thickness shall be exceeded as little as possible.

(c) Blasting shall be done with care to prevent injury to the abutment and dam foundations below and beyond the line of excavation. Blasting shall be limited to the extent and powder approved by the Engineer. No hole for blasting shall be drilled to more than two-thirds (2/3) of the depth of the proposed excavation. As an excavation approaches its final lines, the depth of holes for blasting and the amount of explosives used

per hole shall be progressively reduced. When the Engineer considers that further blasting may be injurious, the excavation shall be completed by wedging and barring or other approved methods.

(d) Excessive and Careless Excavation. All cavities in the foundations or cut-off caused by careless excavation or by the removal of rock needlessly damaged by blasting or other careless operations of the Contractor, as judged by the Engineer, shall be solidly filled with concrete at the Contractor's own expense.

4-04. Preparation of Rock Foundations. The surfaces of the rock foundations on which the concrete is to be placed shall be left rough for secure bond with concrete. Where required by the Engineer steps shall be cut in the surface of the excavation to obtain the necessary roughness as nearly normal to the axis of the dam as is practical without excessive excavation.

4-05. Disposal of Excavated Material shall be made within a radius of 1000-feet of the dam and in such manner that the free flow of water downstream is not interfered with, and shall be subject to the approval of the Engineer. Where required by the Engineer waste piles shall be leveled and trimmed to reasonably regular lines for which the Contractor shall not be entitled to additional compensation.

4-06. Backfill shall be made as and where required by the Engineer. The material, amount and manner of depositing shall be subject to the approval of the Engineer.

4-07. Payment.

(a) Excavation work.

(1) Preliminary survey of the site prior to beginning of work will be made by the Engineer which will establish original surface contours. Measurement for payment will be made from these surfaces without regard to any changes that may occur from natural causes during the prosecution of the work.

(2) Unit prices bid in the schedule will be the basis of payment, and shall include the cost of all labor, materials, equipment and operations required to complete the work. Disposal of excavated material is included in the work.

(3) Measurement. Except as otherwise provided in these specifications or shown on the drawings, excavation will be measured for payment to slopes of 1 to 1 for common excavation and 1/4 to 1 for rock excavation. Where the character of the excavated material allows trimming to the required lines, measurement will be made only for the excavation within the neat lines.

(b) Backfill.

(1) Backfill shall be included for payment in the unit prices bid in the schedule for excavation.

(2) Measurement for payment will be made of material in place to the lines of the required fill as established by the Engineer.

SECTION 5

CONCRETE

5-01. Scope. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations in connection with concrete work, as indicated on the drawings and as specified herein.

Work includes the following:

The dam and bridge
The control house
The valve house
Downstream apron
Outlet pipe supports

5-02. Materials.

(a) Portland Cement shall conform to Type II A.S.T.M. Specification C 150. Only one (1) brand of cement shall be used for work covered by these specifications. Testing of cement shall conform to A.S.T.M. Specification C 77. The total sum of sodium oxide and potassium oxide contained in the cement shall be no more than six-tenths of one percent (0.6%) as determined in accordance with A.S.T.M. Specification C 114.

(b) Aggregates shall be of such soundness that when subjected to five (5) cycles of the test procedure given in A.S.T.M. Specification C 88, using a solution of sodium sulphate, the maximum total weight loss does not exceed six percent (6%) for fine aggregate nor six percent (6%) for coarse aggregate. Aggregate material in the river bed is not considered satisfactory and shall not be used except where specifically tested by the Contractor as satisfactory and approved by the Engineer. Aggregates shall contain no vegetable matter or soft, friable, thin, or elongated particles in quantities considered deleterious by the Engineer.

(1) Fine Aggregate shall be washed concrete sand of hard, strong, durable, uncoated particles and shall conform to A.S.T.M. Specification C 33.

(2) Coarse Aggregate shall be washed gravel or crushed stone, consisting of hard, tough, durable particles free from adherent coating. It shall conform to A.S.T.M. Specification C 33 with grading from material passing four inch (4") screen to material retained on a No. 4 mesh screen for mass and apron concrete, and with material passing one and one-half (1½) inch screen to material retained on a No. 4 mesh screen for reinforced concrete walls, beams, slabs and piers.

Coarse aggregate shall not contain more than fifteen percent (15%) by weight of particles which, when selected by hand and tested in the Los Angeles Rattler, show a loss in excess of fifty-five per cent (55%) after 500 revolutions. The results from the following tests shall not show a loss greater than the following:

Wet Shot Rattler Test	55%
Los Angeles Rattler Test, after 100 revolutions	9%
Los Angeles Rattler Test, after 500 revolutions	35%

(c) Admixture shall be "Pozzoloth" as manufactured by the Master Builders Company, Cleveland, Ohio, "Plastiment" as distributed by Super Concrete Emulsions, Ltd., Los Angeles, California; or equal.

It shall be furnished in sealed containers bearing the name of the manufacturer and the brand name.

(d) Water used in mixing concrete shall be fresh, clean, and free from injurious amounts of oil, acid, alkali, or organic matter. Water from the springs below the dam shall not be used.

(e) Reinforcing bars shall be intermediate grade, open hearth or electric furnace steel conforming to A.S.T.M. Specification A 15.

(f) Copper expansion sealing strips shall be soft annealed number twenty (#20) B & S gage.

(g) Galvanized iron sealing strips shall be number twenty (#20) USS gage.

5-03. Proportioning. Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, admixture, and water so proportioned and mixed as to produce a plastic, workable mixture in accordance with all requirements of this section and suitable to the specific conditions of placement. It is contemplated that the cement content will be a minimum of one and one-tenth (1.1) barrels per cubic yard for the downstream apron concrete and one and one-quarter ($1\frac{1}{4}$) barrels per cubic yard for all other concrete; also, that the admixture content will not exceed five (5) percent of the cement used. Admixture should not be used, except where a uniform, dense concrete of suitable workability cannot be produced without its use as judged by the Engineer.

(a) Required concrete strength. The Contractor shall supply the services of an accredited testing laboratory which shall recommend the proportions of mixes to be used. The recommendations, when approved by the Engineer, shall be strictly complied with. It shall be required that the concrete have at the end of twenty-eight (28) days the following strengths:

(1) Mass concrete for dam shall have a minimum of 3000 pounds per square inch compressive strength. Valve House foundation concrete shall have same strength.

(2) Reinforced concrete for walls, beams, piers and slabs shall have a minimum of 3000 pounds per square inch compressive strength.

(3) Concrete for downstream apron shall have a minimum of 2500 pounds per square inch compressive strength.

(b) Consistency shall be suitable for the methods of placement with the slump (when tested in accordance with A.S.T.M. Specification C 143) not exceeding the following values:

(1) Four (4) inches for concrete in reinforced walls, beams and slabs.

(2) Three (3) inches for concrete in downstream apron and Valve House foundation.

(3) Two and one-half ($2\frac{1}{2}$) inches for mass concrete in dam.

5-04. Mixing. Concrete shall be mixed in an approved batch mixer and may either be mixed at the site of the work or transit-mixed. Adequate equipment and facilities shall be provided for accurate measurement and control of all materials and for readily changing proportions as required. The minimum capacity of the mixing plant shall be six hundred (600) cubic yards per day. The time of mixing each batch in a mixer at the site after all materials are added shall be as follows:

<u>Capacity of mixer</u>	<u>Time of mixing</u>
2 yards and less	$1\frac{1}{2}$ minutes
3 yards	2 minutes
4 yards	$2\frac{1}{2}$ minutes

5-05. Cleaning before placing concrete.

(a) Rock surfaces, immediately before placing concrete, shall be thoroughly cleaned, using stiff brooms, hammers, picks, sand blast, streams of clean water, air or steam or other approved effective means. The surfaces shall be free from oil, mud, debris and pools of water. Then all approximately horizontal surfaces shall be covered with a layer of mortar approximately three-fourths ($3/4$) of an inch thick consisting of the regular concrete mixture without the coarse aggregates or mixed in proportions as directed by the Engineer. The concrete mortar shall be thoroughly worked with brooms or equally effective means into all surface irregularities. Concrete shall then be placed immediately upon the fresh mortar. 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 as determined by the Engineer by the use of forms or other means, that will secure proper union with subsequent work. All horizontal construction joints shall be provided with keys as shown or as directed by the Engineer. All intersections of horizontal construction joints with concrete faces which will be exposed to view shall be made sharp, level and straight. Rock surfaces on which (1) the floors of the control house and valve house (2) The outlet pipe supports and (3) the downstream apron - are placed shall have concrete placed directly on cleaned rock.

(b) Concrete surfaces upon or against which concrete is to be placed shall be thoroughly scrubbed with stiff wire brushes or equally effective means to remove all laitance and loose or defective concrete. This shall be done at the proper stage in the hardening process and in such manner that the surfaces are made suitable for concrete placement in the judgment of the Engineer. If the clean-up is not performed at the proper stage or in such manner to render the surface suitable for bonding with new concrete as determined by the Engineer, the defective surface concrete shall be removed to the

depth directed by the Engineer. After proper surfaces are prepared, all oil, mud, debris and pools of water shall be removed and a layer of mortar one-half inch (1/2") thick of the same composition as specified for "Rock surfaces" above shall be placed on all approximately horizontal surfaces. Concrete shall then be placed directly on the mortar.

5-06. Temperature of Concrete, when deposited, shall not be less than forty degrees (40°) Fahrenheit nor more than eighty-five degrees (85°) Fahrenheit. The method of heating the material required and of protecting the concrete shall be subject to the approval of the Engineer.

5-07. Placing. No concrete shall be placed before all stripping and excavation is satisfactorily completed, unless otherwise approved or directed by the Engineer. Concrete shall be placed before initial set has occurred, and in no event after it has contained its water content for more than forty-five (45) minutes. All concrete shall be deposited as nearly as practicable in final position to avoid segregation and shall be so deposited that it may be effectively compacted in horizontal layers not exceeding eighteen inches (18") in thickness. Each section of work shall be poured in a continuous operation as far as possible. Lifts shall be five (5) feet maximum in height unless otherwise approved by the Engineer. Construction joints shall be provided as shown unless otherwise directed by the Engineer. A minimum of five (5) days shall elapse between the placing of pours that are adjacent to or immediately above one another.

(a) Vibration. Concrete shall be placed with the aid of approved mechanical vibrating equipment. Vibration shall be transmitted directly to the concrete; in no case shall it be transmitted through the forms. The frequency of vibration shall be subject to approval. The intensity and duration of vibration shall be sufficient to accomplish thorough compaction, as approved by the Engineer. Vibration shall be supplemented by forking or spading by hand adjacent to the forms on exposed surfaces in order to secure smooth, dense, even surfaces.

(b) Compaction. The concrete shall be compacted and worked in an approved manner into all corners and angles of the forms and around reinforcement and embedded fixtures.

5-08. Finishing.

(a) Formed exterior surfaces shall be smooth, free from projections and depressions. Immediately after the removal of forms, fins and other projections shall be removed from surfaces. Cavities produced by form ties shall be thoroughly cleaned, saturated with water, and carefully pointed with mortar of the same cement-sand content as the concrete. Surfaces which have been pointed shall be kept moist for a period of twenty-four (24) hours. Finished surfaces shall be free from sand streaks or other voids. Defective surfaces shall be repaired or replaced as approved.

(b) Unformed Surfaces.

(1) Downstream Apron, Walkway of Bridge and Floors of valve and control houses shall be given a wood float finish.

(2) Crest of Dam shall be given a steel trowel finish.

(3) Hand Rail Girders shall receive a Class 2 surface finish as specified in paragraph 3, Section 33 of "Standard Specification, Division of Highways, State of California."

(c) Prohibited Practices.

(1) Excessive Troweling (in the judgment of the Engineer) while the concrete is still plastic will not be permitted.

(2) Addition of Thin Coats of Mortar of neat cement to bring surfaces up to prescribed dimensions will not be permitted.

(d) Repairs shall be made as directed and specified by the Engineer.

5-09. Curing and Protection. The Contractor shall protect all concrete from injury until final acceptance by the District.

(a) Horizontal construction joints shall be kept continuously moist, regardless of time, until they are covered with concrete, unless otherwise directed by the Engineer where surfaces are to be exposed for a prolonged period of time.

(b) Vertical surfaces. The upstream and downstream faces of the dam, the temporarily exposed vertical surfaces of all contraction joints, and the exposed surfaces of concrete in the control and valve houses shall be kept continuously moist for not less than two weeks after the concrete is placed.

(c) Moistening means. The method of keeping concrete moist shall be by continuous sprinkling, spraying, or other methods approved by the Engineer. All water used in curing shall be free from excessive amounts of silt and other impurities.

(d) Horizontal or approximately horizontal finished surfaces shall be covered with sand, earth, or other suitable material as soon as the concrete has set, and kept moist for at least two weeks after placing.

(e) Protection from cold. In freezing weather suitable means shall be provided for maintaining the concrete at a temperature of at least 50° F. for not less than 72 hours after placing or until the concrete has thoroughly hardened. All

concrete shall be protected from freezing by such means as are approved by the Engineer. Where artificial heat is employed special care shall be taken to keep the concrete from drying out.

(f) Removal of coverings shall be made by the Contractor to the satisfaction of the Engineer before final acceptance of the work.

5-10. Forms shall be smooth, mortar tight, true to the required lines and grade, and of sufficient strength to resist any appreciable amount of springing out of shape during the placing of concrete.

(a) Forms for the exterior surfaces of the dam shall be constructed of plywood or shall be sheet metal faced.

(b) Cleaning. All dirt, chips, sawdust and other foreign matter shall be completely removed before any concrete is deposited therein. Forms previously used shall be thoroughly cleaned before being re-used.

(c) Oiling. Before concrete is poured in forms, all inside surfaces of the forms shall be thoroughly coated with an approved form oil. The form oil shall be of high penetrating qualities leaving no film on the surface of the forms that can be absorbed by the concrete.

(d) Fasteners. Only approved bolts or form clamps shall be used to fasten forms in position. They shall be of sufficient strength and number to prevent spreading of the forms and of such type that they can be entirely removed or cut back one (1) inch below the finished surface of the concrete. All forms shall be constructed with stiff wales at right angles to the studs and all form clamps shall extend through and fasten such wales.

(e) Removal. Forms shall be left in place until their removal is approved by the Engineer, and then shall be removed carefully to prevent injury to concrete surfaces.

5-11. Steel reinforcement.

(a) General. Steel reinforcement shall be furnished, cut, bent, and placed as indicated on drawings. At time of placing concrete, all reinforcement shall be entirely free from rust, scale, grease, or other coating which might destroy or reduce its bond with concrete.

(b) Shop drawings, lists, and bending details shall be furnished by the Contractor, as required, and all reinforcement shall be placed in accordance with the drawings and schedules as approved.

(c) Cutting and bending. Steel reinforcement shall be cut and bent in accordance with standard approved practice and by approved machine methods, either at the mill or in the field.

(d) Minimum spacing of bars. The clear distance between parallel bars shall be not less than one and one-half ($1\frac{1}{2}$) times the diameter of round bars or twice the side dimension of square bars and, unless specifically authorized, shall in no case be less than one inch (1").

(e) Protective covering of concrete over steel shall be not less than one and one-half inches ($1\frac{1}{2}$ "), unless otherwise indicated on the drawings.

(f) Splicing. Splice laps of reinforcement shall be adequate to transfer stress by bond. Bars shall be lapped at least forty (40) diameters and splices shall be staggered at least four feet (4'), unless otherwise approved.

(g) Supports. All reinforcement shall be retained in place, true to indicated lines and grades, by the use of approved metal or concrete supports, spacers, or ties. The supports shall be of sufficient strength to maintain the reinforcement in place throughout the concreting operations, shall be completely concealed in the concrete, and shall not discolor the surface of the concrete.

5-12. Embedded Items. Materials required to be built into the concrete work, shall be properly placed and secured in position in the forms before the concrete is poured. All embedded items shall be thoroughly clean and free from coating, rust, scale, oil, or any other foreign matter and shall be so located that the strength of the construction will not be impaired.

5-13. Radial contraction joints provided in the dam shall be sealed using copper strips at the upstream side and galvanized iron strips at the downstream side. The sealing strips shall be carefully jointed together by brazing or welding to form a continuous water tight diaphragm in each joint. The Contractor shall replace or repair at his own expense any damage to the stripping before final acceptance of the work.

5-14. Test of concrete. The Contractor shall take test cylinders while concrete is being poured, in the presence of and at the direction of the Engineer, which shall be tested by the laboratory for compressive strength at the end of seven (7) days and at the end of twenty-eight (28) days. Reports of these tests shall be given to the Engineer in duplicate. Any concrete failing to meet the specified requirements shall be subject to replacement at the Contractor's own expense or retention at a reduction in payment as required by the Engineer. The Engineer shall estimate the extent of the defective concrete.

5-15. Payments for concrete will be made at the unit prices bid in the schedules. Unit price shall include the cost of all labor, materials, equipment, and operations required to complete the work, except as given below.

(a) "Concrete for dam" payment will include the cost of all finishing, and the cost of contraction joints, except that the metal sealing strips, the grouting pipe and fittings, and the grouting are separately scheduled for payment.

(b) "Concrete in parapets, footbridge and piers" payment will include the cost of all finishing and the cost of drains in footbridge.

(c) "Concrete in downstream apron" payment will include the cost of all finishing.

(d) Concrete on Control House and Valve House except concrete required for Valve House foundations will be included for payment in the lump sum bid in the schedule for "Control House and Valve House". Valve House foundation concrete will be paid at the unit price bid in the schedule.

(e) Measurement for payment will be made only to the neat lines shown on the drawings or prescribed by the Engineer. Where more than one thickness is shown the average thickness shown on the drawings will be used as the basis.

5-16. Payment for metal sealing strips will be made at the unit prices per linear foot bid in the schedules which unit price will include the cost of hauling, handling, forming, brazing or welding, placing and maintaining the strips free from damage until acceptance. The measurement will be made of strip in place and no allowance will be made for lap at joints.

5-17. Payment for reinforcing steel, other than in control and valve houses, shall be made at the unit price per pound bid in the schedule, which unit price shall include the cost of all labor, materials, equipment and operations required to complete the work of placing the reinforcing steel. Payment for reinforcing steel in control and valve house is included in the lump sum bid in the schedule for "Control and Valve Houses".

SECTION 6

PRESSURE GROUTING

6-01. Scope. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations in connection with pressure grouting as indicated on the drawings and specified herein.

Work to be done includes:

Foundations for base of dam
Foundations for abutments
Vertical and inclined faces of abutments
Contraction joints

6-02. Materials.

(a) Piping shall be of sizes shown. Pipe shall be black standard pipe; fittings shall be malleable iron.

(b) Grout.

(1) Cement, Sand, Admixture, Water and Mixing shall conform to requirements of Section 4 "Concrete." In addition, the sand shall be of such fineness that one hundred per cent (100%) will pass a screen with sixty-four (64) openings per square inch, and fifty per cent (50%) will pass a screen with one thousand six hundred (1600) openings per square inch.

(2) Proportioning. Grout for filling ordinary foundation rock seams and contraction joints shall be a mixture of neat cement and water in proportions approved by the Engineer. Clay or other suitable colloidal material may be added for grouting minute rock seams and sand, or other suitable material may be added where large rock crevices or cavities are to be filled.

6-03. Grouting Operations.

(a) Drilling of Grout Holes shall be in accordance with the drawings and as required by the Engineer. They shall be drilled before concrete is laid.

(1) Depth of Holes. Grout holes shall be drilled in the bottom of the cut-off trench spaced on centers as shown. It is expected that these holes will have a required depth of approximately twenty (20) feet.

(2) Size of Hole. Grout holes shall not be less than one and five-eighths ($1\frac{5}{8}$) inches in diameter at the bottom.

(3) Protection. All drilled holes shall be carefully plugged at the top for temporary safeguard against obstruction during construction work.

(b) Setting Pipe. Piping shall be set over grout holes, crevices in rock, springs and other defects as shown or required by the Engineer. Piping for grout holes shall be placed twelve (12) inches into the grout holes drilled in the foundation rock. The space between grout pipes and the concrete or rock into which they are inserted shall be carefully caulked with oakum or other approved material prior to grouting.

(c) Preliminary Cleaning and Test.

(1) Grout Holes. Before pressure grouting is begun, all grout holes drilled with percussion drills shall be thoroughly washed out with clean water under continuous pressure, in a manner which will permit free outflow, as by inserting a smaller pipe and introducing wash water at the bottom of the hole. All grout holes shall be tested with clean water under continuous pressure up to one hundred (100) pounds per square inch as required by the Engineer.

(2) Contraction Joint Grouting System. All pipe and fittings shall be thoroughly cleaned immediately before concrete is placed about them. After each lift of the grouting system is placed and before any concrete is placed about it, and at such other times as the Engineer may direct, the pipe shall be tested by forcing a current of air under pressure through it to the satisfaction of the Engineer, after which it shall be immediately temporarily capped or otherwise closed to avoid entry of any material until it is pressure grouted. Any pipe clogged (due to any cause) before final acceptance of the work shall be cleaned or opened to the satisfaction of the Engineer. Where pipe is clogged, alternate means of supplying the necessary grouting where approved by the Engineer may be used with the cost of such work to be at the Contractor's own expense.

(d) Apparatus for mixing and placing grout shall be of a type approved by the Engineer. Unless otherwise directed by the Engineer, all grout shall be pumped, preferably with a duplex piston displacement pump. The equipment shall be maintained properly to insure continuous, efficient performance during any grouting operation.

(e) Placing Grout. Grout shall be forced into place in a continuous, uninterrupted flow at a pressure of one hundred (100) pounds per square inch unless otherwise specified. Grouting shall not be stopped until grout is taken at a rate less than one (1) cubic foot in fifteen (15) minutes under the required grouting pressure.

(1) Foundation Grouting shall be done only after concrete within a fifty (50) foot radius has been placed to ten (10) foot minimum depth.

(2) Contraction Joint Grouting shall be done at such time as approved by the Engineer. It shall be done in

separate successive lifts beginning at the foundation and finishing at the top of the dam. The location and dimensions of each grouting lift shall be as shown on the drawings. Just before grouting any section of a joint, the section to be grouted and all other sections of ungrouted joints at the same level in the dam shall be filled with water which shall be applied so that the water level in all joints is kept at approximately the same elevation during the filling. During grouting, the water level in all joints shall be maintained at approximately the elevation of the top of the section being grouted. The grout shall be pumped into the bottom header of the system for the section, forcing the water out of the joint ahead and above the grout. The outlet end of each pipe shall be left open until grout of proper consistency for retention in the joint begins to flow from it, whereupon it shall be capped. The pressure applied to the bottom header shall be such that the resulting pressure in the contraction joint at the top of the section being grouted will be approximately 50-pounds per square inch. The grout shall be forced into all parts of the system for the section being grouted and shall completely fill this section in the shortest practicable time in order to insure that the grout does not set in any part of the system before grouting of the section is completed. In no case shall the time consumed in filling any section of a joint with grout exceed one-half hour, and the grouting equipment shall have ample capacity to meet this requirement. The simultaneous application of grout at two or more points in any one system shall be made, if determined by the Engineer as necessary.

(f) Capping. If during the grouting of any hole, grout is found flowing from adjacent grout connections in sufficient quantity to seriously interfere with the grouting operation or cause appreciable loss of grout, such connections may be temporarily capped. Where such capping is not essential, ungrouted holes shall be left open to facilitate the escape of air and water as the grout is forced in.

(g) After Completion of Grouting, the pressure shall be maintained by means of a stop cock or other suitable device until the grout has set sufficiently to retain itself in the hole.

6-04. Additional Grout Holes to those shown may be considered necessary by the Engineer before or after completion of the specified ones. These holes shall be drilled by the Contractor at the unit prices bid for this work in the schedule, with no additional allowance for the moving of equipment or other expenses incidental to returning to an old area or moving into a new one.

6-05. The Right to Change the Depth, Spacing or Location of Grout Holes is reserved by the Engineer; the Contractor shall not be entitled to additional compensation because of such changes.

6-06. Payments.

(a) Grout Holes. Payment will be made upon measurement of actual lengths at the unit price bid in the schedule, unless

otherwise specified. Unit price shall include the cost of all labor, materials, equipment and operations required in drilling holes and maintaining them free from obstructions until grouted.

(b) Grouting. Payment will be made at the unit prices per cubic foot bid in the schedules. Unit price shall include the cost of all labor, materials, equipment and operations required for the grouting, except the drilling of foundation holes and the pipe and fittings work. No payment will be made for grout lost due to the improper anchorage of grout pipes or grout rejected by the Engineer for improper mixing. Measurement will be made in the grouting machine on the basis of the number of sacks of cement and cubic feet of sand or other materials counted separately, which are actually forced into the holes or grout connections at the direction of the Engineer or required to fill permanent pipes. The volume of one (1) sack of cement will be taken as one (1) cubic foot. The volume of sand and other materials will be taken at its loose dry volume.

(c) Pipe and Fittings required for grouting will be paid for at the unit price bid in the schedule per pound, and will be made only for pipe and fittings actually installed. The weights per linear foot of pipe and per fitting used for payment calculations will be the average weights of each determined by the Engineer. Unit price shall include the cost of all labor, materials, plant and operations required in placing and maintaining the pipe and fittings until final approval of the work.

SECTION 7

DRAINAGE SYSTEM

7-01. Scope. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations in connection with the drainage system indicated on the drawings and specified herein.

Work to be done: The drainage system will consist of rows of draitile located on twenty (20) foot centers placed across the dam and resting in separate trenches excavated in the foundation under the lift gravity section of the dam and in the downstream apron bed. The draitile will be completely surrounded by gravel as shown on the drawings. The gravel on top of the draitile will be level with the adjacent rock base and covered with a layer of waterproofing felt.

7-02. Materials.

(a) Draitile shall be "standard draitile", of size shown on drawings, meeting the requirements of A.S.T.M. Specification C 4.

(b) Gravel shall be the same as coarse aggregate specified in "Concrete" Section 7 of these specifications, except that material passing one and one-half inch ($1\frac{1}{2}$ ") screen to material retained on a No. 4 mesh screen shall be used.

(c) Waterproofing felt shall be 15-pound felt in accordance with A.S.T.M. Specification D 226.

7-03. Excavation of trenches shall be in accordance with applicable paragraphs of "Earthwork" section of these specifications and as shown on the drawings.

7-04. Installation. The draitile shall be laid on the layer of gravel covering the bottom of the trench with spacing between sections as shown on the drawings. The gravel on the sides and top of the draitile shall be carefully placed to prevent displacement of tile, and the felt covering shall be securely placed.

7-05. Tests. As directed by the Engineer, each row of draitile shall be tested to ascertain that it has not become obstructed or inoperative, as judged by the Engineer. The Contractor shall correct the defects at his own expense.

7-06. Payment shall be made at the unit price per linear foot bid in the schedule.

(a) Unit price shall include the cost of all labor materials, equipment and operations required to install the drainage system and maintain it free from obstructions until acceptance of the work by the District.

(b) Measurement for payment will be in length of drainage tile in place.

SECTION 8

STRUCTURAL STEEL

8-01. Scope. The work covered by this section consists of furnishing all labor, materials, equipment, and performing all operations in connection with structural steel as indicated on the drawings or specified herein.

Work included:

- (a) Trash rack
- (b) Stem guide frame
- (c) Control house and valve house structural members and floor grating.

8-02. Shop Drawings. No material shall be fabricated or delivered until the shop drawings have been approved. Fabrication, assembling, and erection shall conform to approved shop drawings. Approval of shop drawings means approval of general methods only, and does not constitute an approval of dimensions, figures, or quantities. The Contractor shall be responsible for all errors of fabrication and for the proper fitting of the various members shown on the shop drawings.

8-03. Materials.

(a) Structural Steel shall conform to A.S.T.M. Standard Specification No. A 7. The Contractor shall furnish certified copies in duplicate of all records of tests covering the chemical and physical properties of all structural steel. Unidentified stock material, if approved, may be used for minor details which carry little or no stress; provided, that the Contractor can show that such stock material was manufactured under a specification substantially equal to A.S.T.M. Specifications.

(b) Rivet Steel shall conform to A.S.T.M. Standard Specification A 141.

(c) Arc-welding Electrodes shall conform to A.S.T.M. Specification A 233, and shall be delivered to the job in unbroken packages bearing the name of the manufacturer.

(d) Turned Bolts or "Rivet Bolts" shall be "Dardelet" rivet bolt or equal.

(e) Floor Grating shall be as noted on the drawings.

8-04. Workmanship.

(a) General. The rules and practices recommended by the American Institute of Steel Construction shall be followed unless otherwise specified.

All workmanship shall be equal to the best practice in modern structural shops.

(b) Assembling. In assembling and during fabrication the component parts of built-up members shall be securely held in close contact by sufficient clamps or other adequate means. The several pieces forming built sections shall be straight and fit close together and the finished members shall be free from twists, bends or open joints.

(c) Welding and Welders. The surfaces of all openings, seams, or joints to be welded shall be free from rust, scale, or grease. Welding shall be electric shielded arc process, and shall comply with recommendations given in "Welding Handbook" of American Welding Society. Exposed welds shall be peened with a light air hammer or approved equal.

8-05. Erection. The Contractor shall install structural steel work as shown on the drawings.

(a) Bracings and Supports necessary for holding work securely in place and for safely sustaining all loads that may be imposed during erection shall be provided. Any portion of concrete slab floors in place, and under steelwork or used by steel erectors, shall be properly protected by heavy planks kept in place during such use.

(b) Turned Bolts or "Rivet Bolts" may be used where it is impossible to drive satisfactory rivets. Where turned bolts are used, holes shall be reamed in the field.

(c) Field Welding and Riveting shall be of the same workmanship as done in the shop.

8-06. Shop Painting. Before applying shop coat, all surfaces shall be thoroughly cleaned of all oil, dirt, scale and corrosion by sandblast or other approved means.

(a) Trash rack and stem guide frame shall be given shop finishes applicable to pipe as specified in American Water Works Association (AWWA) Specification 7A.5 for the type of exposure surfaces are subjected to.

(b) Control house and valve house metal surfaces shall be given one (1) prime coat of "8-2 Ironhide" paint as made by Pittsburgh Plate Glass Co. or equal. Floor gratings shall be given a second prime coat and a finish coat of "8-1 Ironhide" paint. Surfaces that will be inaccessible after erection or installation shall be given a second prime coat.

8-07. Payments.

(a) Trash rack and stem guide frame. Payment for work shall be in accordance with the unit price (per pound) bid in the schedule for "Trash rack and stem guide frame." Unit price will include all labor, materials, equipment and operations necessary for fabricating

painting, erecting and installing the work.

(b) Control house and valve house structural members and floor grating work shall be included for payment in the lump sum bid in the schedule for "Control house and valve house."

SECTION 9

MISCELLANEOUS WORK

9-01. Scope. The work covered by this section consists of furnishing all labor, equipment and materials, and performing all operations in connection with miscellaneous metalwork as indicated on the drawings or as specified herein..

Work Included:

(a) Piping, (including sluice gate mounting flanges, pipe couplings, flanges and access manholes) from the dam to the valve house outlets, and from the dam to the downstream outlet for the center sluice gate.

(b) Control House and Valve House doors, window bars, wall hooks, floor manhole cover and flashings.

(c) Installation of District-furnished Items:

(1) Sluice gates

(2) Gate valves

(d) Vent piping for sluice gates

(e) Drains in foot bridge

(f) Plaque

9-02. Materials.

(a) Pipe (Water) shall be three-eighths (3/8) inch wall thickness and be in accordance with American Water Works Association (AWWA) Specification 7A.3 and 7A.4. Edges shall be prepared for field butt welding or for Dresser type coupling as required. Hoops as shown shall be welded to surfaces to be set in dam concrete.

(b) Tapered (Water) Pipe Section and Manhole Construction shall meet the requirements for strength called for in AWWA Specification 7A.3 for welds.

(c) Access Manhole and Cover mounted in pipe opening, shall be of one-half (1/2) inch steel. The cover shall be provided with lift handles and gasketing.

(d) Couplings and Flanges.

(1) Plain Compression Coupling shall be "Style 38 Dresser" type.

(2) Expansion Joint Compression Coupling shall be "Style 63 Dresser" type.

(3) Flanges shall be slip-on welding flange, in accordance with the American 150-pound Steel Flange Standards,

and shall have faces companion to adjacent faces of valves and meter; or shall be fabricated as indicated or by other approved methods.

(e) Doors shall be "No. 3070 Swing Door" as made by Truscon Steel Co., or equal.

(f) Gasketing shall be sheet rubber or cloth inserted sheet rubber.

(g) Flashings at sash and door shall be galvanized sheet metal.

(h) Vent Piping for Sluice Gates. Pipe shall be standard galvanized; fittings shall be malleable iron, galvanized, and shall be of size shown on the drawings.

(i) Drains for Foot Bridge shall be four (4) inch galvanized iron, standard, pipe located as shown.

9-03. Installation.

(a) Water Piping shall be mounted on prepared concrete cradles unless otherwise supported. A protective pad of packing or felt shall be placed between the cradle and pipe. All welding of sections shall comply with the recommended practice given in the American Welding Society "Handbook." Bolted flange connections shall be suitably gasketed.

(b) Vales, Gates and Doors shall be installed in approved manner and shall be free from binding or any condition interfering with proper operation.

(c) Flashings shall be installed so as to insure water-tight results.

(d) Vent Piping shall be installed in such manner that no obstruction or clogging results. Before acceptance of this work by the District, the Engineer will test piping for such defects, which if found shall be corrected by the Contractor at his own expense.

(e) Placque as shown on the drawings shall be mounted at location selected by the District's representative.

9-04. Shop Protective Coatings. Before applying shop coat, all surfaces shall be thoroughly cleaned of all oil, dirt, corrosion & scale by sand blasting or other approved means.

(a) Pipe (Water), Mechanical Couplings, Flanges and Manhole shall be given coatings in accordance with AWWA Specifications 7A.5 and 7A.6, except that exterior surfaces of pipe to be set in concrete shall be cleaned but not receive any protective coating. Type A or Type B enamel shall be used as required by the Engineer. Threaded surfaces of couplings shall be free from coatings but have a Parkerize or other rust inhibiting finish not interfering with proper assembly.

(b) Door, Window Bars, Wall Hooks and Manhole in Concrete shall be given one (1) prime coat of "8-2 Ironhide" paint as made by the Pittsburgh Plate Glass Co., or equal.

9-05. Payments.

(a) Vent Piping for Sluice Gates. Payment will be made at the unit price bid in the schedule. Unit price will include all materials, labor, equipment and operations required to furnish and install the work and maintain it free from obstructions until acceptance. Measurement for payment will be at the linear feet of piping installed.

(b) Control House and Valve House doors, window bars, wall hooks, floor manhole cover and flashings work will be included for payment in the lump sum bid in the schedule for "Control House and Valve House."

(c) Piping (Water), (including flanges, couplings and manhole,) extending from dam to valve house outlets and from dam to downstream outlet for center sluice gate shall be paid in accordance with the unit price per pound bid in the schedule. Unit price shall include all materials, labor, equipment and operations required to furnish the completed work.

(d) District Furnished Equipment installation and painting, and plaque will be paid for on a cost-plus basis. It shall be computed in accordance with the "Extra, Additional or Omitted Work-Payment" paragraph of the "General Conditions" section of these specifications. (The money allowance given in the schedule is used for the purpose of facilitating the comparison of bids only.)

(e) Drains in Foot Bridge shall be included for payment in the unit price bid in the schedule for "Concrete in Parapets, Piers and Bridge."

SECTION 10

STEEL SASH

10-01. Scope. The work covered by this section consists of the furnishing of all labor, equipment, and materials, and the performance of all operations in connection with furnishing and erecting the steel sash, complete with hardware and erection fittings in the control house and valve house.

10-02. Glazing. Glass and glazing is specified under "Glazing" section.

10-03. Materials.

(a) Sash. Sash shall be commercial type, sizes, and arrangement as shown. All sections shall be especially designed of hot rolled, new billet steel. All frame members shall be special angle sections and shall allow three-quarter (3/4) inch continuous anchorage.

(b) Hardware. The operating hardware shall be packed separately for attachment on the job.

10-04. Construction.

(a) General. All frame and ventilator corners, all joints at frames shall be welded and mortise and tenon joints. Double contact weathering continuous around all four sides shall be provided for ventilators. Frame sections at vent sills shall have weep-holes to provide for drainage.

(b) Muntins shall be continuous, vertically and horizontally, and shall be interlocked at intersections.

(c) Mullions. Vertical mullions and attaching bolts shall be provided as noted on the drawings to combine two (2) or more sash in a single opening.

(d) Ventilators shall be provided in types as shown.

(e) Glazing. Steel sash shall be arranged for inside, putty glazing. Sash manufacturer shall supply spring steel wire glazing clips for the thickness of glass used.

10-05. Shop Painting. Sash and hardware shall be bonderized and given one (1) dipped coat of "8-2 Ironhide" as made by Pittsburgh Glass Co. or equal, before delivery to the site.

10-06. Erection. Sash shall be erected in prepared openings by the sash manufacturer. They shall be set plumb and true, properly aligned and securely anchored, with vents correctly adjusted before glazing. The ventilators shall be left in smoothly operating condition, without binding, but closing in a weather-tight manner.

10-07. Payment is included in the lump sum bid in the schedule for "Control house and valve house."

SECTION 11

GLAZING

11-01. Scope. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations in connection with glazing, as indicated on the drawings and specified herein.

Work included: Sash and doors of control house and valve house.

11-02. Materials.

(a) Glass shall be "Polished Wire Glass" as made by the Mississippi Glass Co., Fullerton, California, or equal. It shall have the factory label on each pane which shall be removed only after final approval.

(b) Putty shall be red, Class B, in accordance with A.S.T.M. Standard Specification D 317. It shall be delivered to the site in original unopened containers.

11-03. Glazing.

(a) General. Sizes of glass indicated on the drawings are approximate. Measurement for actual sizes of glass shall be taken from sash and frames. Glass shall be accurately cut to fit the frame. All edges shall be smooth and shall not be sharp or ragged.

(b) Installation. All glass shall be bedded in putty, back puttied, and face puttied. Equal bearing the entire width of each pane shall be obtained.

11-04. Protection and Replacement. The Contractor shall be responsible for all glass broken in the execution of his work and shall replace same at no expense to the District.

11-05. Cleaning. Upon completion of the work, the Contractor shall remove all dirt, stains and excess putty, clean and polish all exposed glass, and leave work in acceptable condition.

11-06. Payment is included in lump sum bid in schedule for "Control House and Valve House."

SECTION 12

FIELD PAINTING

12-01. Scope. The work covered by this section consists of furnishing all labor, materials and equipment, and performing all operations in connection with painting as specified herein.

12-02. Surfaces to be Painted shall be all exposed surfaces of the following:

(a) Piping, (including couplings, manhole and flanges) from dam to outlets of valve house, and from dam to downstream outlet for center sluice gate.

(b) Trash rack and stem guide frame.

(c) District-furnished sluice gates and gate valves.

(d) Control house and valve house: structural steel, floor grating, steel sash, doors, window bars, lift hooks and floor manhole.

12-03. Materials shall be as scheduled; no substitutions shall be made, except with written approval of the Engineer. All materials shall be factory ready-mixed and shall be brought to the building site in original, unbroken containers. No materials shall be reduced, except in accordance with the manufacturer's directions.

(a) Oil shall be raw linseed oil in accordance with A.S.T.M. Specification D 234.

(b) Turpentine shall be in accordance with A.S.T.M. Specification D 13.

(c) Field Coatings for Pipe and Couplings shall be in accordance with American Water Works Association (AWWA) specifications 7A.5 and 7A.6 for the type of exposure subjected to.

(d) Primer for metal surfaces other than pipe and submerged equipment shall be "8-2 Ironhide" paint as made by Pittsburgh Glass Co., or equal.

(e) Finish Coat for metal surfaces other than pipe & submerged equipment shall be "8-1 Ironhide" paint as made by Pittsburgh Glass Co., or equal.

12-04. Application. All imperfections in shop-applied prime coats shall be touched up before field coatings are applied. Care shall be taken to prevent paint from impairing operation of moving parts.

(a) Piping and Appurtenances shall be field coated in accordance with AWWA Specification 7A.5 and 7A.6. (Work covered in 12-02(a) and (b) only.)

(b) All Other Metal Surfaces shall be given one (1) prime and one (1) finish field coat.

12-05. Payments.

(a) Control House and Valve House: structural steel, floor grating, steel sash, doors, window bars, lift hooks and floor manhole field painting will be included for payment in the lump sum bid in the schedule for "Control House and Valve House."

(b) Trash Rack and Stem Guide Frames Payment for field painting will be included in the unit price per pound bid in the Schedule for "Trash Rack ~~AND STEM GUIDE FRAME~~."

(c) Piping and appurtenances from dam to outlets of valve house, and from dam to downstream outlet of center sluice gate shall have payment for field painting included in the unit price per pound bid in the schedule under "Water Piping."

(d) Other Work of this section will be paid for on a cost-plus basis. It shall be computed in accordance with the "Extra, Additional or Omitted Work-Payment" paragraph of the "General Conditions" Section of these specifications. (The money allowance given in the Schedule is used for the purpose of facilitating the comparison of bids only.)