

Final

EXHIBIT B

GENERAL SPECIFICATIONS
FOR STORAGE AND IRRIGATION WORKS NEAR
ESCONDIDO, CALIFORNIA FOR SAN DIEGUITO
MUTUAL WATER COMPANY.

GENERAL SPECIFICATIONS
FOR BUILDING CARROLL DAM AND CONDUIT

for the
SAN DIEGUITO MUTUAL WATER COMPANY.

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GENERAL

DESCRIPTION.

1. The work to be done under these specifications consists of the construction of certain storage and irrigation works for the San Dieguito Mutual Water Company in the vicinity of Escondido, California.

It is the object of these specifications to provide for all material (except cement and valves as hereafter specified) and all labor, plant and equipment necessary to build structures herein provided for.

2, Whenever the word "company" or a pronoun in place of it is used, the same is understood to mean the San Dieguito Mutual Water Company. Whenever the word "engineer" or a pronoun in place of it is used, the same is understood to mean the Engineer duly authorized by said Company acting either directly or through his properly authorized agents. Such agents acting within the scope of the particular duties entrusted to them. Whenever the word "contractor" or a pronoun in place of it is used, the same is understood to mean the person or persons or co-partnership or corporation engaged in the construction of

the work herein described as the party of the second part of his or their legal representative.

The contractor will commence the work herein required to be done, within 10 days after the signing of the contract unless the engineer shall authorize or direct a further delay and at his own proper cost and expense, and on or before January 1, 1918 for the Carroll Dam; and March 1, 1918 for the balance of the contract, shall complete all the work and furnish all the labor, machinery, tools and materials except as herein specified; to do everything required to build and put in complete working order the Carroll Dam, Carroll Conduit, and all appurtenant structures herein described.

3. The plans and specifications are intended to be explanatory of each other; but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained in either, the parties hereto further agree that the explanation and decision of the Engineer shall be final and binding on the Contractor; and all directions and explanations required, alluded to or necessary to complete any of the provisions of this contract and specifications, and give them due effect, shall be given by the Engineer. Correction of errors or omissions in drawings or specifications may be made by the Engineer when such correction is necessary for the proper fulfilment of the intention of such drawings or specifications, the effect of such correction to

date from the time that the Engineer gives due notice thereof to said Contractor.

4. To prevent all disputes and litigation, the Engineer shall be referee, in all cases, to decide upon the amount, quality, acceptableness and fitness of the several kinds of work and materials which are to be paid for under this contract, and upon all questions which may arise relative to the fulfilment of the contract on the part of the Contractor, and his estimates and decision shall be final and conclusive; and such estimate and decision, in case any question shall arise, shall be a condition precedent to the right of said Contractor to receive any money under this agreement; also that said Engineer, by himself or by assistants or inspectors acting for him, shall inspect the materials furnished and the work done under this Agreement, to see that the same strictly correspond with the specifications hereinafter set forth. And the Contractor also agrees that he will at all times give to the Engineer, his assistants and inspectors, ladders, tools and labor, and all facilities necessary for inspecting the materials furnished and the work done under this agreement.

5. The methods throughout this work shall conform to what is recognized as good practice.

6. All accepted materials delivered at or near the site of the works are to be considered the property of the

Company and cannot be removed without the Company's consent.

**UNDESIRABLE
EMPLOYEES.**

7. Any incompetent, disorderly or otherwise undesirable employees shall on request of the Engineer be dismissed and not again employed on this work.

**INSPECTION
OF MATERIAL.**

8. All materials and supplies delivered at or near the site of the works are subject to inspection and if condemned at any time by the Engineer, shall be so branded, and shall upon demand be removed at once to a satisfactory distance.

9. No inspection of any work or materials shall constitute an acceptance of same prior to the final acceptance of full completion of this contract, and all work or materials rejected by the Engineer at any time prior to final acceptance shall be at once made good by the Contractor.

**SUPERVISION
OF WORK.**

10. The Contractor must give this work his personal attention and at all times have a competent foreman, experienced in this class of work, on the ground, authorized to accept orders from the Engineer.

LOCATION.

11. The character of foundation and conditions at the site as shown on the plans or indicated by the Engineer are supposed to be approximately correct, but the contractor should depend upon his own examination as the Company does not guarantee the information.

WORK TO CON-
FORM TO
LINES, GRADES,
ETC. FORCE
ACCOUNT.

12. All work, during its progress and on its completion shall conform to the lines and levels given by the Engineer, and shall be built in accordance with the contract plan and directions given from time to time by him.

If any emergency demands, or if the Engineer deems it necessary for the production of suitably and safely designed structures he may make alterations in the line, grade, plan, form, position, dimensions or material of the work herein contemplated, or of any part thereof, either before or after the commencement of construction.

If such alterations diminish the quantity of the work to be done, they shall not constitute a claim for damages or for anticipated profits on the work that may be dispensed with; if they increase the amount of work, such increase shall be paid for according to the quantity actually done and at the price established for such work under this contract; or in case there is no price established, it shall be paid for at its actual reasonable cost, as determined by the Engineer, plus ten (10%) per cent of said cost.

In no case shall any work in excess of the requirements of the plans and specifications be paid for unless ordered in writing by the Engineer.

13. If there is anything in these specifications

or in the plans or specifications as now or hereinafter furnished which is not clear and intelligible to the Contractor, he shall not proceed with such work as ordered until he shall have drawn the attention of the Engineer to the element of doubt or misunderstanding, in writing, and have had the same explained to him, but it is the duty of the Contractor to examine the plans and site of the work far enough in advance to anticipate any needed explanation, and he will not be granted extension of time for misunderstanding or failing to understand any instructions.

TEMPORARY
BRIDGES OR
CROSSINGS.

14. Whenever it is necessary to cross roads or railroads, the Contractor shall, at his own expense, provide suitable and safe bridges or other sufficient crossings for the accommodation of the travel on said roads; and shall maintain the same in good and safe condition until the roads can be restored, when he shall remove all bridges and other temporary expedients, and restore said roads to a condition suitable for use all to be satisfactory to the Engineer. The Contractor shall give reasonable notice to the owners of railroads and private ways before interfering with them. He shall provide watchmen, red lights and fences at his own expense, and take such other precautions as may be necessary to protect life and property; and shall be liable for all damage occasioned in any way by his act or neglect, or that of his

agents, employees or workmen.

CEMENT. 15. Cement will be furnished to the contractor by the Company in carload lots f.o.b. cars Escondido, Encinitas, or Del Mar, as desired by Contractor; but a charge of 10 cents will be made for each sack for which the contractor may receive such refund as the Cement Company allows. The Contractor must give 15 days' notice to the Company of his requirements.

Contractor must protect the cement while in his charge prior to use, and the quantity will be checked at the site by the Company's inspector corresponding with the number of sacks unloaded from cars. Cement lost, damaged or rendered useless while in Contractor's possession will be charged against him, as well as any wilful waste or unnecessary use thereof.

**VALVES, PIPES,
ETC.**

16. All valves and pipe necessary for the service and sluice outlets will be furnished by the Company to the contractor f.o.b. cars Escondido, Encinitas or Del Mar as the contractor may desire.

17. The contractor shall at his own expense convey the materials from the points where they are delivered by the Company and shall at his own expense store the same in the vicinity of the work. He shall be responsible for loss incurred or damage done to materials furnished by the Company

from the time of their delivery until the work is accepted.

**MATERIAL
AND WORK-
MANSHIP.**

18. All material and workmanship is to be the best of the kind specified. The Contractor shall produce and allow inspection by the Engineer of all bills, statements and vouchers showing the quality, amount and cost of all material and labor entering into extra work.

SAND.

19. The fine aggregate shall consist of sand or screenings of gravel or crushed stone, free from dust, graded from fine to coarse and passing when dry a screen having one quarter ($\frac{1}{4}$) inch diameter holes, it preferably shall be of siliceous material, and not more than 30% by weight shall pass a sieve having 40 meshes per linear inch, it shall be clean, and free from soft particles, lumps of clay, vegetable loam or other organic matter. If the tensile strength developed by the fine aggregate in a 1:3 Mortar is less than 85 per cent of the strength of a 1:3 Ottawa-sand mortar, the material shall be rejected.

If sand complying with these specifications can not be obtained for use on Carroll Dam within two miles of the dam, the Company will stand the additional cost in excess of \$1.00 per cubic yard of obtaining the same elsewhere as directed by the Engineer.

**COARSE
AGGREGATE.**

20. Coarse aggregate shall consist of gravel or

crushed stone, which is retained on a screen having one-quarter ($\frac{1}{4}$) inch diameter holes, and shall be graded from the smallest to the largest particles, it shall be clean, hard, durable, and free from all deleterious matter. Aggregates containing dust and soft particles, shall be excluded. The gravel or crushed stone shall be separated into two sizes and remixed in the proper proportion, in case it is not found uniformly graded, from the min. size of quarter inch to the max. size which will pass a $2\frac{1}{2}$ inch ring.

WATER. 21. The water used in mixing concrete shall be free from oil, acid, alkali, or organic matter.

GENERAL SPECIFICATIONS

REINFORCING STEEL. 22. Steel used for reinforcement either in tension or compression shall comply with the following specifications, and shall be in shapes and sizes called for on the detailed plans and more detailed specifications.

1. Steel shall be made by the Open Hearth process from standard billets. Material rerolled from T-rails or scrap of any kind will not be accepted.

2. Deformed bars of the round or square corrugated type shall be used as specified. Cold twisted square bars will not be accepted as deformed bars.

3. The chemical and physical properties shall conform to the following specifications:--

Phosphorus, maximum, Basic process 0.04%, acid process 0.06%

Sulphur, maximum 0.05%

Ultimate strength, pounds per square inch:-

Minimum 70000

Maximum 85000

Yield Point, pounds per square inch:-

Minimum 40000

Elongation, per cent in 8 inches, minimum $\frac{1125000}{\text{Ultimate Strength}}$

Cold Bends, without fracture:- 180 degrees

Bars under $\frac{3}{4}$ " $d = 3T$

Bars $\frac{3}{4}$ " and over $d = 5T$

Where $d = \underline{\quad}T$ signifies "around a pin whose diameter is times the thickness or diameter of specimen.

4. ^uBending tests may be made by pressure or by blows.

All tests shall conform in method and manner to the standards prescribed by the American Society for testing materials.

5. All steel shall be free from injurious seams, flaws, cracks, defective edges or other defects, and have a smooth, uniform and workmanlike finish.

6. As far as practicable the melt, the year rolled and the name or initials of manufacturer are to be rolled or stamped on all finished steel bars.

7. Material, which subsequent to the tests at the

mill and its acceptance there, develops weak spots, brittleness, cracks or other imperfections, or is found to have injurious defects, will be rejected and shall be replaced by the Contractor at his own cost.

9. Inspectors, retained by the Company, will be authorized to reject all material which does not conform to these specifications. All material shall be tested before shipment from the rolling mills or warehouse and the Contractor shall furnish the Company with evidence in writing that this has been done and that the steel complies with the specifications, guaranteeing to the Company the identical material covered by the tests and inspection.

10. Reinforcing steel shall be free from excessive rust, loose scale or other coatings of any character which would reduce or destroy the bond, and it shall be cleaned if necessary to secure this.

11. The contractor shall furnish the inspector on the work, statements showing exact shipping weights in detail for all material covered by his inspection.

12. The Contractor shall bear the cost of any suit arising through the reinforcing material furnished being deemed to infringe other patents and shall pay such damage as may be awarded in said suit in consequence of the use of such infringing material.

PROPORTION. 23. The proportions of the raw materials for the

concrete shall be accurately determined by density experiments made by the Engineer from time to time to ascertain the relative coarseness of the aggregate in order to fix the proportions necessary to a concrete of maximum density.

The contractor shall use such proportions until notified by the Engineer to change, due to changes in the aggregate,

The cement shall be measured by the sack as packed by the manufacturer containing approximately 94 pounds net, and considered equivalent to 95/100 cubic feet. Other aggregate shall be measured as shoveled loose into a measuring box or barrel.

**HAND
MIXING.**

24. If the concrete, or any part of it, is mixed by hand, the cement and aggregate must be thoroughly mixed dry until mixture is of uniform color, and the water added on a thoroughly water tight platform, the amount of mixing shall be sufficient to produce a concrete of uniform color and appearance with the stones thoroughly incorporated into the mortar and the consistency uniform throughout.

**MACHINE
MIXING.**

25. If the concrete is mixed in a machine mixer, the machine shall be so arranged that the materials, including the water can be regularly and precisely proportioned, and which will produce a concrete of uniform consistency and color with the stones thoroughly mixed and incorporated with the mortar. The aggregate shall be turned in the mixer for

the minimum length of time of one and one quarter ($1\frac{1}{4}$) minutes, if a half yard mixer, is used and one and one-half ($1\frac{1}{2}$) minutes, if a one yard mixer is used, after all the ingredients are assembled in the mixer. The number of revolutions of the mixer shall be so regulated as to give at the periphery of the drum a uniform speed between 160 and 200 feet per minute. If the mixer is of two yards capacity or more, the time a batch is to be turned shall not be less than two minutes.

SURFACES. 26. Noticeable voids and stone pockets discovered when forms are struck shall be immediately filled with mortar mixed in the same proportion as the mortar in the concrete. No allowance for labor or material over and above the normal unit price will be allowed for preparation of joints or filling of voids or stone pockets. The surfaces shall have no special treatment other than care in placing the concrete to avoid voids or stone pockets.

FORMS. 27. The lumber for the forms and the design of the forms shall be adapted to the structure. The forms shall be sufficiently tight to prevent loss of mortar. They shall be thoroughly braced or tied together so that the pressure of concrete or the movement of men, machinery or materials, shall not throw them out of place. Forms shall be left in place until in the judgment of the Engineer the concrete has attained sufficient strength.

STEEL. 28. All reinforcing steel must occupy the exact position called for on the drawings, and method of placing must be such, that the reinforcement cannot be displaced by the operation of placing concrete. Length of overlapping reinforcement shall be equal to at least 24 diameters of bars.

QUANTITIES. 29. All concrete will be measured in the finally completed structures and will be paid for to the amount actually placed in the structures. No allowance will be made for the amount used for refilling any part of the excavation made in excess of that called for by the drawings or specifications, except as authorized in writing by the Engineer.

QUARRIES. 30. Quarries and borrow pits may be opened only on sites where excavation, in the judgment of the Engineer, will not endanger the safety or stability of the structures contemplated.

EXTRA WORK. 31. Contractor shall make no claims for extra work unless the same shall be ordered by the Engineer.

All claims for extra work must be filed with the Engineer by the 10th of the month following that in which the work is performed.

**GENERAL RE-
QUIREMENTS.** 32. In all the operations connected with the work herein specified, all laws controlling or limiting in any way the actions of those engaged on the works, or affecting the

materials applied to them, must be respected and strictly complied with.

NO SPIRITUOUS LIQUORS.

33. The Contractor shall neither bring nor allow others to bring any spirituous or fermented liquor, or other intoxicant, upon the grounds occupied for the prosecution of the work; neither shall he furnish nor allow others to furnish liquors or other intoxicant, to the workmen in his employ or to any person or persons in the vicinity.

34. Grounds in the vicinity of the work and all camps in which employes are quartered shall be maintained in a proper, sanitary condition as directed by the Engineer.

35. After the work is finished, all materials, rubbish and debris shall be removed from the site, and the site cleaned up satisfactory to the Engineer.

36. Excavation will be classified as follows:

EARTH -- Will include all material other than Loose Rock and Solid rock.

Loose rock- Will include all stone and detached rock lying in separate and contiguous masses containing not over $\frac{1}{2}$ cubic yard; this classification includes cemented gravel, hard pan and similar material.

SOLID ROCK- Includes all rock occurring in solid masses exceeding $\frac{1}{2}$ cubic yard, which can not be removed without blasting.

Corrected
Apr 24, 1917.

Substituted for #13

Set No ~~4~~ 1-4

No 1

GENERAL SPECIFICATIONS

FOR STORAGE AND IRRIGATION WORKS NEAR

ESCONDIDO, CALIFORNIA FOR SAN DIEGUITO

MUTUAL WATER COMPANY.

GENERAL SPECIFICATIONS
FOR BUILDING CARROLL DAM AND CONDUIT
for the
SAN DIEGUITO MUTUAL WATER COMPANY

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GENERAL

DESCRIPTION. 1. The work to be done under these specifications consists of the construction of certain storage and irrigation works for the San Dieguito Mutual Water Company in the vicinity of Escondido, California.

It is the object of these specifications to provide for all material (except cement and valves as hereafter specified) and all labor, plant and equipment necessary to build structures herein provided for.

2. Whenever the word "company" or a pronoun in place of it is used, the same is understood to mean the San Dieguito Mutual Water Company. Whenever the word "engineer" or a pronoun in place of it is used, the same is understood to mean the Chief Engineer of the said Company acting either directly or through his properly authorized agents. Such agents acting within the scope of the particular duties entrusted to them. Whenever the word "contractor" or a pronoun in place of it is used, the same is understood to mean the person or persons or co-partnership or corporation engaged in the construction of the work herein

described as the party of the second part or his or their legal representative.

The contractor will commence the work herein required to be done within 10 days after the signing of the contract unless the engineer shall authorize or direct a further delay and at his own proper cost and expense and on or before Jan. 1, 1918 for Carroll Dam and March 1, 1918 for the balance of the contract. shall complete all the work and furnish all the labor, machinery, tools and materials except as herein specified, to do everything required to build and put in complete working order Carroll Dam, Carroll Conduit, ^{San Dieguito Dam} and all appurtenant structures herein described.

3. The plans and specifications are intended to be explanatory of each other; but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained in either, the parties hereto further agree that the explanation and decision of the Engineer shall be final and binding on the Contractor; and all directions and explanations required, alluded to or necessary to complete any of the provisions of this contract and specifications, and give them due effect, shall be given by the Engineer. Correction of errors or omissions in drawings or specifications may be made by the Engineer when such correction is necessary for the proper fulfilment of the intention of such drawings or specifications, the effect of such correction to date from the time that the Engineer gives due notice thereof to said Contractor.

4. To prevent all disputes and litigation, the Engineer shall be referee, in all cases, to decide upon the amount, quality, acceptableness and fitness of the several kinds of work and mater-

ials which are to be paid for under this contract, and upon all questions which may arise relative to the fulfilment of the contract on the part of the Contractor, and his estimates and decision shall be final and conclusive; and such estimate and decision, in case any question shall arise, shall be a condition precedent to the right of said Contractor to receive any money under this agreement; also that said Engineer, by himself or by assistants or inspectors acting for him, shall inspect the materials furnished and the work done under this agreement, to see that the same strictly correspond with the specifications hereinafter set forth. And the Contractor also agrees that he will at all times give to the Engineer, his assistants and inspectors, ladders, tools and labor, and all facilities necessary for inspecting the materials furnished and the work done under this agreement.

5. The work shall be commenced and carried on at such points, and in such order of precedence, and at such times and seasons, as may from time to time be directed by the Engineer.

6. The quantities of work to be done and materials to be furnished, as given in the accompanying "Notice to Contractors", are for the purpose of comparing, on a uniform basis, the bids offered for the work under the contract.

7. If an emergency demands, or if the Engineer deems it desirable, he may make alterations in the line, grade, plan, form, position, dimensions or material of the work herein contemplated, or of any part thereof, either before or after the commencement of construction. If such alterations diminish the quantity of work to be done, they shall not constitute a claim for damages, or for anticipated profits on the work that may be

dispensed with; if they increase the amount of work, such increase shall be paid for according to the quantity actually done and at the price established for such work under this contract; or, in case there is no price established, it shall be paid for at its actual reasonable cost, as determined by the Engineer, plus ten per cent of said cost.

8. All materials delivered at or near the site of the works are to be considered the property of the Company and cannot be removed without the Company's consent.

UNDESIRABLE EMPLOYEES. 9. Any incompetent, disorderly or otherwise undesirable

employees shall on request of the Engineer be dismissed and not again employed on this work.

INSPECTION OF MATERIAL. 10. All materials and supplies delivered at or near the

site of the works are subject to inspection and if condemned at any time by the Engineer, shall be so branded, and shall upon demand be removed at once to a satisfactory distance.

11. No inspection of any work or materials shall constitute an acceptance of same prior to the final acceptance of full completion of this contract, and all work or materials rejected by the Engineer at any time prior to final acceptance shall be at once made good by the Contractor.

SUPERVISION OF WORK. 12. The Contractor must give this work his personal

attention and at all times have a competent foreman, experienced in this class of work, on the ground, authorized to accept orders from the Engineer.

LOCATION. 13. The character of foundation and conditions at the site as shown on the plans or indicated by the Engineer are supposed to be approximately correct, but the contractor should

depend upon his own examination as the Company does not guarantee the information.

WORK TO CON-
FORM TO LINES,
GRADES, ETC.

14. All work, during its progress and on its completion shall conform to the lines and levels given by the ENGINEER, and shall be built in accordance with the contract plan and directions given from time to time by him, subject to such modifications and additions as shall be deemed necessary by him during its execution; and in no case shall any work in excess of the requirements of the plans and specifications be paid for unless ordered in writing by him.

15. If there is anything in these specifications or in the plans or specifications as now or hereinafter furnished which is not clear and intelligible to the Contractor, he shall not proceed with such work so ordered until he shall have drawn the attention of the Engineer to the element of doubt or misunderstanding, in writing, and have had the same explained to him, but it is the duty of the Contractor to examine the plans and site of the work far enough in advance to anticipate any needed explanation, and he will not be granted extension of time for misunderstanding or failing to understand any instructions.

TEMPORARY
BRIDGES OR
CROSSINGS.

16. Whenever it is necessary to cross roads or railroads, the Contractor shall, at his own expense, provide suitable and safe bridges or other sufficient crossings for the accommodation of the travel on said roads; and shall maintain the same in good and safe condition until the roads can be restored, when he shall remove all bridges and other temporary expedients, and restore said roads to a condition suitable for use, all to be satisfactory to the Engineer. The Contractor shall give reason-

able notice to the owners of railroads and private ways before interfering with them. He shall provide watchmen, red lights and fences at his own expense, and take such other precautions as may be necessary to protect life and property; and shall be liable for all damage occasioned in any way by his act or neglect, or that of his agents, employees or workmen.

CEMENT. 17. ^{Cement} Will be furnished to the contractor by the Company in carload lots f.o.b. cars Escondido, Encinitas, or Del Mar, as desired by Contractor; but a charge of 10 cents will be made for each sack for which the contractor may receive such refund as the Cement Company allows. The Contractor must give 15 days notice to the Company of his requirements.

Contractor must protect the cement while in his charge prior to use, and the quantity will be checked at the site by the Company's inspector corresponding with the number of sacks unloaded from cars. Cement lost, damaged or rendered useless while in Contractor's possession will be charged against him, as well as any wilful waste or unnecessary use thereof.

VALVES, PIPES, ETC. 18. All valves and pipes necessary for the service and sluice outlets will be furnished by the Company to the contractor f.o.b. cars Escondido, Encinitas or Del Mar as the contractor may desire.

19. The contractor shall at his own expense convey the materials from the points where they are delivered by the Company and shall at his own expense store the same in the vicinity of the work. He shall be responsible for loss incurred or damage done to materials furnished by the Company from the time of their delivery until the work is accepted.

**MATERIAL
AND WORK-
MANSHIP.**

20. All material and workmanship is to be the best of the kind specified. The contractor shall produce and allow inspection by the Engineer of all bills, statements and vouchers showing the quality, amount and cost of all material used.

SAND.

21. The fine aggregate shall consist of sand or screenings of gravel or crushed stone, graded from fine to coarse and passing when dry a screen having one-quarter ($\frac{1}{4}$) inch diameter holes, it preferably shall be of siliceous material, and not more than 30% by weight shall pass a sieve having 50 meshes per linear inch, it shall be clean, and free from soft particles, lumps of clay, vegetable loam or other organic matter. If the strength developed by the fine aggregate in a 1:3 Mortar is less than 70% of the strength of a 1:3 Ottawa-sand mortar, the material shall be rejected.

If sand complying with these specifications can not be obtained for use on Carroll Dam within two miles of the dam, the Company will stand the additional cost in excess of \$1.00 per cubic yard of obtaining the same elsewhere as directed by the Engineer.

**COARSE
AGGREGATE.**

22. Coarse aggregate shall consist of gravel or crushed stone, which is retained on a screen having one-quarter ($\frac{1}{4}$) inch diameter holes, and shall be graded from the smallest to the largest particles, it shall be clean, hard, durable, and free from all deleterious matter. Aggregates containing dust and soft particles, shall be excluded. The gravel or crushed stone shall be separated into two sizes and remixed in the proper proportion, in case it is not found uniformly graded, from the min. size of quarter inch to the max. size which will pass a 2 $\frac{1}{2}$ inch ring.

WATER.

23. The water used in mixing concrete shall be free from oil, acid, alkali, or organic matter.

**REINFORCING
STEEL.**

24. Steel for reinforcement shall be in shapes and sizes called for on the detail plans and in the specifications and shall be deformed bars, preferably corrugated bars.

The steel shall conform to the following requirements, subject to such modification as the Engineer deems necessary to meet the existing market.

(1) All steel shall be made by the open hearth process from standard billets, and shall conform to the following requirements.

(2) Phosphorus content shall not exceed:

0.04% basic process, 0.06% acid process.

(3) Sulphur content shall not exceed 0.05%.

(4) Ultimate tensile strength per square inch 55000#-70000#.

(5) Yield point shall not be less than 33000 #.

(6) Elongation in a test piece 8" long, shall not be less than 130000 divided by the U. T. S. nor shall the resulting quotient be less than 1.22.

(7) A test piece shall bend cold without cracking, 180 degrees around a pin whose diameter is twice that of the piece under test.

(8) Square twisted bars shall have not less than:-

Four complete turns in a length of 12" for $\frac{1}{4}$ " bars
2- $\frac{1}{4}$ " " " " " " " " $\frac{1}{4}$ " "
1- $\frac{1}{4}$ " " " " " " " " 1" "
1 " " " " " " " " 1- $\frac{1}{4}$ " "

(9) The bars are to be twisted uniformly by machine, and the minimum cross section area shall not vary after twisting more than 2- $\frac{1}{2}$ % from the original section. Where twisted bars are tested after fabrication the elongation in an 8 inch piece shall not be less than 5%, and the yield point shall not be less than 36,000 lbs.

(10) Mesh reinforcing may be either open hearth or Bessemer process steel wire, drawn but not annealed.

(11) All steel shall be free from cracks, seams and irregular edges, and shall be finished in a uniform workmanlike manner.

(12) All tests shall conform in method and manner to the standards prescribed by The American Society for Testing Materials.

(13) Inspectors will be retained by the company authorized to reject all material which does not conform to these specifications; they shall at all times have access to all parts of the mill or shop where the material is being made or fabricated.

(14) Material, which subsequent to the above tests at the mill and its acceptance there, develops weak spots, brittleness, cracks or other imperfections, or is found to have harmful defects, will be rejected and shall be replaced by the Contractor at his own sole cost.

(15) Steel shall be free from excessive rust, loose scale or coatings of any character which will impair or destroy the bond between it and the concrete.

(16) The shipped weight of bars may vary 2- $\frac{1}{2}$ % from the calculated weight of any lot; excess weight above 2- $\frac{1}{2}$ % will not be paid for, bars more than 2- $\frac{1}{2}$ % under calculated weight will not be accepted.

(17) The contractor will furnish inspector on the work a statement showing exact shipping weights in detail, for all material covered by his inspection.

(18) All steel shall be tested before shipment from the mill or warehouse.

(19) The contractor must guarantee to the company the identical material covered by the tests and inspection.

(20) The contractor must bear all costs of litigation arising from his material being held to be an infringement of patent, and shall pay such damages as may be awarded for such infringement, holding the company harmless.

¹⁷ Before being used in concrete it shall be cleaned free from all scale, dirt, paint and oil.

All secondary reinforcement such as netting, wire, or ties shall be of the best quality obtainable.

PROPORTIONS. 25. The proportions of the raw materials for the concrete shall be accurately determined by density experiments made by the Engineer from time to time to ascertain the relative coarseness of the aggregate in order to fix the proportions necessary to a concrete of maximum density. The Contractor shall use such proportions until notified by the Engineer to change, due to changes in the aggregate. The Cement shall be measured by the sack as packed by the manufacturer containing approximately 94 pounds net, and considered equivalent to 95/100 cubic foot. Other aggregate shall be measured as shoveled loose into a measuring box or barrel.

HAND
MIXING.

26. If the concrete, or any part of it, is mixed by hand, the cement and aggregate must be thoroughly mixed dry until mixture is of uniform color, and the water added on a thoroughly water tight platform, the amount of mixing shall be sufficient to produce a concrete of uniform color and appearance with the stones thoroughly incorporated into the mortar and the consistency uniform throughout.

MACHINE
MIXING.

27. If the concrete is mixed in a machine mixer, the machine shall be so arranged that the materials, including the water can be regularly and precisely proportioned, and which will produce a concrete of uniform consistency and color with the stones thoroughly mixed and incorporated with the mortar. The aggregate shall be turned in the mixer for the minimum length of time of one and one quarter ($1\frac{1}{4}$) minutes, if a half yard mixer is used, and one and one-half ($1\frac{1}{2}$) minutes, if a one yard mixer is used, after all the ingredients are assembled in the mixer. The number of revolutions of the mixer shall be

so regulated as to give at the periphery of the drum a uniform speed between ^{160 and} 200 feet per minute. If the mixer is of two yards capacity or more, the time a batch is to be turned shall not be less than two minutes.

CONSISTENCY. 28. The materials shall be mixed wet enough to produce a concrete of such a consistency, that it will flow sluggishly into the forms, and which at the same time can be conveyed from the mixer to the forms without separation of the coarse aggregate from the mortar. Excess water shall be avoided, as it tends to a separation of the parts.

PLACING. 29. Concrete after completion of the mixing shall be conveyed rapidly to the place of final deposit, under no circumstances shall concrete be used which has partially set. Concrete shall be deposited in such a manner, that will permit the most thorough compacting such as can be obtained by working with a straight shovel or slicing tool kept moving up and down until all the ingredients are in their proper places. Special care shall be exercised to prevent the formation of laitance. Where laitance has formed after the day's work or after any form has been filled, spaded and allowed an interval of setting not greater than one-half ($\frac{1}{2}$) hour, and while the concrete yet remains in a semi-fluid condition, the top portion shall be removed and thrown out to such a depth as will expose coarse aggregate in the mass. This will be done by the Inspector who will also keep a record of the amount thrown out - this will be allowed in the measurements. When placing fresh concrete upon an old concrete surface the latter shall be roughened, cleansed of all foreign material and laitance, thoroughly wetted and then

slushed with a neat cement mortar or a 1:1 cement and sand mortar, as the Engineer may direct. This wash or coat to be immediately followed by the fresh concrete. The concrete is to be deposited in block rather than in slices. Where concrete is delivered and conveyed by spouting, the delivery from the spout shall be as close as possible to the point of deposit. The angle of the spout with the horizontal shall be such as to allow the concrete to flow without separation of the ingredients one vertical to two horizontal in general. The surface of concrete exposed to premature drying shall be kept covered and wet for a period of at least 7 days after it is deposited.

SURFACES. 30. Noticeable voids and stone pockets discovered when forms are struck shall be immediately filled with mortar mixed in the same proportion as the mortar in the concrete. No allowance for labor or material over and above the normal unit price will be allowed for preparation of joints or filling of voids or stone pockets. The surfaces shall have no special treatment other than care in placing the concrete to avoid voids or stone pockets.

FORMS. 31. The lumber for the forms and the design of the forms shall be adapted to the structure. The forms shall be sufficiently tight to prevent loss of mortar. They shall be thoroughly braced or tied together so that the pressure of concrete or the movement of men, machinery or materials, shall not throw them out of place. Forms shall be left in place until in the judgment of the Engineer the concrete has attained sufficient strength.

STEEL. 32. All reinforcing steel must occupy the exact position called for on the drawings, and method of placing must be such, that the reinforcement can not be displaced by the operation of placing concrete. Bars nearest the water side must have 2" of cover. Length of overlapping reinforcement shall be equal to at least 24 diameters of bars.

QUANTITIES. 33. All concrete will be measured in the finally completed dam, and ~~reinforcing steel~~ will be paid for to the amount actually placed in the dam. No allowance will be made for the amount used for refilling any part of the excavation made in excess of that called for by the drawings or specifications.

QUARRIES. 34. Quarries and borrow pits may be opened only on sites approved by the Engineer, and excavated only to the extent approved by the engineer.

EXTRA WORK. 35. Contractor shall make no claims for extra work unless the same shall be ordered by the Engineer.

All claims for extra work must be filed with the Engineer by the 1st of the month following that in which the work is performed.

GENERAL REQUIREMENTS. 36. In all the operations connected with the work herein specified, all city or town ordinances, and all laws controlling or limiting in any way the actions of those engaged on the works, or affecting the materials applied to them, must be respected and strictly complied with.

NO SPIRITUOUS LIQUORS. 37. The Contractor shall neither bring nor allow others to bring any spirituous or fermented liquor, or other intoxicant, upon the grounds occupied for the prosecution of the

work; neither shall he furnish nor allow others to furnish liquors or other intoxicant, to the workmen in his employ or to any person or persons in the vicinity.

(38) Grounds in the vicinity of the work and all camps in which employes are quartered shall be maintained in a proper sanitary condition as directed by the Engineer.

(39) After the work is finished all materials, rubbish and debris shall be removed from the site, and the site cleaned up satisfactory to the Engineer.

40. Excavation will be classified as follows:

Earth - Will include all material other than Loose rock and solid rock.

Loose Rock - Will include all stone and detached rock lying in separate and contiguous masses containing not over 1/2 cubic yard; this classification includes cemented gravel, hardpan and similar material.

Solid Rock - Includes all rock occurring in solid masses exceeding 1/2 cubic yard, which cannot be removed without blasting.

SPECIFICATIONS FOR
P L A I N C O N C R E T E P I P E L I N E S

PIPE: Shall be of the "taper joint" pattern, having both ends accurately moulded by iron rings, the socket end being formed on the bottom. It shall be made in not less than two foot lengths. When making the pipe, care must be taken to keep the core centered so that the shell will be of practically uniform thickness. All workmanship shall be up to recognized best standards.

PROPORTIONS. All pipe shall be made of Cement Concrete composed of one part (by measure) cement to three parts of clean dry aggregates. The aggregates may be mixed sand and gravel or mixed sand and crushed rock. The sand and gravel, or sand and crushed rock shall be so proportioned to each other as to give the densest body compatible with a fairly smooth pipe. This will ordinarily be about 40% gravel or screened crushed rock, to 60% sand. Crusher run of rock, or natural mixture of sand and gravel may be used where same conforms to the above requirements.

MIXING: Mixing must be complete and thorough, and no water used until the dry mixture is of a uniform color throughout. Mixing may be done by hand or by machine. When machine is used it shall be a batch mixer or a type which will as nearly

as possible discharge a dry batch without separating the stones. The dumping type is preferred. When hand mixing is employed it shall be done with hoes in a tight box and the materials shall be thoroughly hoed to alternate ends of the box at least three times **dry**, and at least two times **wet**. In this operation the "bite" shall be small enough so that the hoe rides on the bottom of the box for the full length of every draw stroke.

All concrete shall be mixed as wet as it is possible to make the pipe stand without distortion.

PLACING. Placing the concrete in the molds shall be uniformly and evenly done and at such a rate as to cause the tamper to make not less than four complete rounds for each linear foot of pipe.

The concrete shall not be thrown into the molds in such a way as to cause the stones to separate and fly to the back of the mold, producing a rough or coarse section on that side of the pipe.

The filling of forms shall be continuous, and if for any reason the work is stopped long enough for the cement to take its initial setting, any partly filled forms shall be emptied.

TAMPING: Shall be done with an iron tamper having a face not over five inches long, and a thickness of not over three fourths of the thickness of the shell of the pipe. Tamper

strokes must overlap each other sufficiently to insure no skipping. Tamping shall be continuous during the feeding and shall be vigorous and hard so as to produce a dense tight pipe, containing no soft or uneven spots. In making the tops or spigot end, sufficient concrete shall be piled on the top to require approximately 20 hard blows of the "top former" or "Rimmer" to form the spigot. The tongue of the spigot end must be strong and dense.

COATING. A thick brush coat of neat cement and water shall be put on the inside of the pipe. This coating must be dense and tough and after it is dry must be set tight to the pipe so as not to rub off or powder under the hand when rubbed.

WETTING. All pipe must be kept wet for 7 days after making, and watering must be continuous during daylight. At least one man watering must be used for each "tamp". Special care must be taken to see that the pipe is kept as full of water as possible during the first dry. It is the intent that all pipe shall not only be kept a dark color for the first week but shall be kept soaked through with water. All pipe shall be marked showing date of manufacture.

PIPE LAYING. Trench width must be not less than 10 inches greater than the outside diameter of the pipe. Trench bottom must be graded to conform to stakes, which will be set by the owner at least every 50 feet along the line.

Ends of pipe must be clean before putting together and must be thoroughly wet just previous to cementing. Joint mortar shall be made of one part cement to two parts good clean sand thoroughly mixed dry and wet only as needed for immediate use. The method shall be to reduce the wetted mortar to the desired plasticity by thoroughly working rather than by a harmful flooding with water. The mortar must make a complete and unbroken collar around the entire joint on the outside.

On pipe of a sufficient diameter for a man to work inside, a complete band of mortar shall be made on the inside of the joint with a trowel. These bands shall be left as smooth and flat as possible, to prevent obstruction of flow, but shall completely fill any gaps between the ends of the pipe. This inside work shall be done after the pipe has been firmly bedded by backfilling, or otherwise not sooner than 24 hours after the outside joint has been made. Joints must be thoroughly wet inside just before mortaring. Previous to settling, joints shall be protected from sun and wind by backfilling or otherwise.

SPECIFICATIONS

REINFORCED CONCRETE PIPE.

PIPE: Shall be constructed of concrete reinforced with steel. It shall be made in sections not less than three feet in length, and so formed that when the sections are laid together and cemented they shall make a continuous and uniform line of pipe.

PROPORTIONS: Used in the construction of pipe shall consist of the following mixture:

1 part of Portland Cement.

2 parts of sand.

3 parts of crushed stone or clean coarse gravel.

In determining quantities per batch, aggregates shall be dry when measured.

MIXING. All concrete shall preferably be mixed by machine of the batch type. Materials shall be turned until the mass is of a uniform color; then water added sufficient to produce a mixture that will flow, and the whole mixed until of a uniform consistency. When hand mixing is employed it shall be done in accordance with requirements, for hand mixing in the specifications for plain concrete pipe, attached.

PLACING. The concrete shall be placed in the forms as quickly as possible after being mixed. The filling of forms

shall be continuous and if for any reason the work is stopped long enough for the cement to take its initial set, any partly filled forms shall be emptied. While the concrete is being placed in the forms it shall be thoroughly spaded to produce a uniformly dense concrete.

COATING. A thick brush coating of neat cement and water shall be put on the inside of the pipe. This coating must be dense and tough and after it is dry must be set tight to the pipe so as not to rub off or powder under the hand when rubbed.

FORMS. Shall consist of iron or steel bottom and top rings and steel plates rolled to a true circle. The latter shall be reinforced, if necessary to prevent distortion while the concrete is being placed. Forms shall not be removed from the pipe before the cement has attained its final set. Joints between plates shall be tight to prevent leakage of concrete and plates shall be locked together in such a manner that the joint will be smooth without offset.

REINFORCEMENT. The reinforcement shall consist of American Steel and Wire Company's triangular mesh or spirals of Bessemer Wire hard grade properly held in position by accurate spacers. Sizes and spacing of wires shall be as shown in Schedule "A" attached hereto and made a part of these specifications.

**FINISHING
AND CURING.**

As soon as the forms are removed from the pipe it shall be protected from the sun by burlap, for a period of three days, and shall be kept wet for a total period of seven days. All pipe shall be marked showing the date of manufacture.

PIPE LAYING.

Trench width must be not less than 10 inches greater than the outside diameter of the pipe. Trench bottom must be graded to conform to stakes, which will be set by the owner at least every 50 feet along the line. Ends of pipe must be clean before putting together and must be thoroughly wet just previous to cementing. Joint mortar shall be made of one part cement to two parts good clean sand thoroughly mixed dry and wet only as needed for immediate use. The method shall be to reduce the wetted mortar to the desired plasticity by thoroughly working rather than by a harmful flooding with water. The mortar must make a complete and unbroken collar around the entire joint on the outside.

On pipe of a sufficient diameter for a man to work inside, a complete band of mortar shall be made on the inside of the joint with a trowel. These bands shall be left as smooth and flat as possible, to prevent obstruction of flow, but shall completely fill any gaps between the ends of the pipe.

17 Office Copy 9/17 Set 15
Spec 5-a

SPECIFICATIONS NO. 5-A

Alternative to Reinforced Concrete Syphon, proposals for Redwood Pipe with manufacturers specifications will be received for this portion of Specification No.5 to fulfill the following general requirements.

About 1900 linear feet 42 Inch Redwood Pipe on saddles including about 150 linear feet on trestles, complete and ready for service; the maximum static head of the profile to be provided for with a factor of safety of 6. Leakage test to be not more than 1 cubic feet per 24 hours for each 300 linear feet of pipe.

91A

DETAIL SPECIFICATIONS

FOR CARROLL CONDUIT

---oOo---

These specifications cover the construction of a conduit with a capacity of 36 second feet from the Carroll Dam to the Upper San Dieguito Reservoir, the total distance approximating 25,000 lineal feet. The work will embrace open lined canal, closed lined conduit, concrete pipe siphons, steel flume on concrete supports and concrete flume on support, on bench or trussed to span short distances. The Contractor is to do and complete all work and furnish all the labor, machinery, tools and materials, except as herein specified, and to do everything required to build and put in complete working order, the specified section of conduit.

The contractor is to make the requisite excavation for building the conduit and all appertaining structures; to do all ditching, dyking, pumping or otherwise disposing of water, all sheeting, shoring, bracing and supporting, all fencing, lighting and watching; to make all provision necessary to maintain fences, culverts, and other structures; to repair all damage done to such structures; to maintain travel on roads adjacent to the work; to construct all foundations, all masonry and timber work; to set in place all iron work furnished by the Company, and to clear away all rubbish and surplus material.

EXCAVA-
TION.

The trenches in which the conduit and appurtenances are

to be constructed shall be excavated in all cases in such manner and to such depths and widths as will give suitable room for building the structures they are to contain.

The bottom of the trench is in general to be excavated to the form and size of the concrete lining shown on the drawings.

In rock excavation the drilling and blasting must be conducted with all possible care; caps or other exploders shall in no case be kept in the same place in which dynamite is stored; and in general the precautions against accident from blasting shall be entirely satisfactory to the Engineer. But the Contractor is liable for all damage to person or property caused by blast or explosive.

Payment for excavation shall be made to the neat lines of the masonry lining as shown on the drawings.

OPEN LINED
CANAL.

When conditions are favorable, the conduit will be constructed as an open ditch, lined on the bottom and sides with concrete 5 inches in thickness, composed of the ingredients hereinbefore specified mixed in the proportion of 1:2:4, maximum size 3/4 inch.

When the excavation is in rock and the lines are sufficiently regular, a plaster coat on the rock may be substituted for the concrete lining. The proportions of the plaster coat shall be 1:3.

Payment shall be made for the actual volume of concrete in place as determined from the measurements of the Engineer.

Where the outline of the trench is irregular, the volume of concrete will be determined by batch measurement.

**CLOSED LINED
Conduit.**

Whenever the maintenance of an open lined ditch is deemed a menace to the interests of the Company, the conduit shall be covered with a reinforced concrete slab as shown on the drawings. The proportions for this purpose shall be 1:2:4, the ingredients to be as hereinbefore specified.

Payment will be made for the actual amount placed as determined by the Engineer, the price bid for lining the closed conduit to include the slab reinforcement.

**CONCRETE
PIPE.**

When directed by the Engineer, the Conduit shall consist of reinforced concrete pipe of approved design, constructed of the materials hereinbefore specified or their equivalent. Contractors will submit specifications of the pipe to be furnished which shall be capable of safely supporting a head, of 100 feet, and the leakage under working conditions shall not be at a greater rate than one cubic foot per 24 hours for each 500 feet of pipe.

Payment will be made for the actual lineal feet of pipe in place as determined by the Engineer.

METAL FLUME ON CONCRETE SUPPORTS

Metal flumes shall approximate the dimensions shown on the contract plans and may be of any approved type which meets the following conditions:

The metal shall have a corrosive resistance equal to that of American Ingot Iron. The resistance to flow shall be such that when laid with an inclination of one foot in one thousand feet, a semi-circular cross-section will discharge not less than 36 cubic feet per second.

The joining of successive lengths of flume shall be accomplished in a manner to insure that the structure shall be absolutely watertight.

**CONCRETE
SUPPORTS.**

The metal flume shall be supported upon a concrete trestle composed of uprights, braces and girders substantially as indicated on the attached drawings. The entire structure shall be so proportioned that upright bents will be at least 15 feet apart on centers.

The concrete is to be composed of ingredients hereinbefore specified mixed in the following proportions:-

For upright bents	1:2:4	reinforcement	1%
For girders	1:2:4	reinforcement	1%

The supporting members may be poured in place or cast by the unit system and erected by shears, derricks or other suitable means. Should the unit system be used, the reinforcement shall be of proper volume and distributed to meet erection stresses.

Bids will be received upon the designs shown on the contract drawings, but consideration will be given submitted designs acceptable to the Engineer.

All workmanship must be of the best.

Payment will be made on the basis of lineal feet of flume and supports in place as determined by the Engineer.

**CONCRETE
CONDUIT.**

At the discretion of the Engineer, portions of the conduit may be constructed of concrete, of rectangular cross section which may be erected on a bench graded for the purpose; supported on a

concrete trestle or designed with side girders for short spans.

This type of structure shall conform to the contract drawings and may be poured in place or cast on the unit system.

The mixture shall be in the proportion of 1:2:4 for both conduit and supports.

Payment will be made for the lineal feet of completed conduit as determined by the Engineer. The necessary excavation will be paid for by the cubic yard at the price bid for trench excavation.

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100-A

S P E C I F I C A T I O N S

for

FURNISHING AND INSTALLING PIPE

DISTRIBUTION LINES - 1A, 2B, 2C, 2D and 2F

NEAR DEL MAR, CALIFORNIA

for

SAN DIEGUITO MUTUAL WATER COMPANY

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SPECIFICATIONS
for
FURNISHING AND INSTALLING PIPE
DISTRIBUTION LINES - 1A, 2B, 2C, 2D and 2F
NEAR DEL MAR, CALIFORNIA
for
SAN DIEGUITO MUTUAL WATER COMPANY

---oOo---

GENERAL

DESCRIPTION. 1. The work to be done under these Specifications consists of the furnishing of pipe, and the installation in trenches previously dug of certain distribution lines of the works for the San Dieguito Mutual Water Company in the vicinity of Del Mar, California.

It is the object of these specifications to provide for all material (Except air, stop and blow-off valves and tee connections and accessories as hereinafter specified) and all labor, plant and equipment necessary to build the pipe lines herein provided for.

2. Whenever the word "Company" or a pronoun in place of it is used, the same is understood to mean the San Dieguito Mutual Water Company. Whenever the word "Engineer" or a pronoun in place of it is used, the same is understood to mean the Chief Engineer of the said Company acting either directly or through his properly authorized agents. Such agents acting within the scope of the particular duties entrusted to them. Whenever the word "Contractor" or a pronoun in place of it is used, the same is understood to mean the person or persons or co-partnership or corporation engaged in the construction of the work herein described as the party of the second part or his or their legal representative.

The contractor will commence the work herein required to be done within 10 days after the signing of the contract (unless the Engineer shall authorize or direct a further delay) and at his own proper cost and expense and on or before March 15th 1918 shall complete all the work and furnish all the labor, machinery, tools and materials except as herein specified, to do everything required to build in the previously excavated trench, and put in complete working order the several distribution pipe lines and appurtenant structures herein described.

3. The plans and specifications are intended to be explanatory of each other; but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained in either, the parties hereto further agree that the explanation and decision of the Engineer shall be final and binding on the Contractor; and all directions and explanations required, alluded to or necessary to complete any of the provisions of this contract and specifications, and give them due effect, shall be given by the Engineer. Correction of errors or omissions in drawings or specifications may be made by the Engineer when such correction is necessary for the proper fulfillment of the intention of such drawings or specifications, the effect of such correction to date from the time that the Engineer gives due notice thereof to said Contractor.

4. To prevent all disputes, and litigations, the Engineer shall be referee, in all cases, to decide upon the amount, quality, acceptableness and fitness of the several kinds of work and mater-

ials which are to be paid for under this contract, and upon all questions which may arise relative to the fulfillment of the contract on the part of the Contractor, and his estimates and decision shall be final and conclusive; and such estimate and decision, in case any question shall arise, shall be a condition precedent to the right of said Contractor to receive any money under this agreement; also that said Engineer, by himself or by assistants or inspectors acting for him, shall inspect the materials furnished and the work done under this agreement, to see that the same strictly correspond with the specifications hereinafter set forth. And the Contractor also agrees that he will at all times give to the Engineer, his assistants and inspectors, tools and labor, and all facilities necessary for inspecting the materials furnished and the work done under this agreement.

5. The methods throughout this work shall conform to what is recognized as good practice for the particular style of construction herein contemplated.

6. The quantities of work to be done and materials to be furnished, as given in the accompanying "Notice to Contractors", are for the purpose of comparing, on a uniform basis, the bids offered for the work under the contract.

7. If an emergency demands, or if the Engineer deems it desirable, he may make alterations in the line, grade, plan, form, position, dimensions or material of the work herein contemplated, or of any part thereof, either before or after the commencement of construction. If such alterations diminish the quantity of work to be done, they shall not constitute a claim

for damages, or for anticipated profits on the work that may be dispensed with; if they increase the amount of work, such increase shall be paid for according to the quantity actually done and at the price established for such work under this contract; or, in case there is no price established, it shall be paid for at its actual reasonable cost, as determined by the Engineer, plus ten per cent of said cost.

8. All materials delivered at or near the site of the works are to be considered the property of the Company and cannot be removed without the Company's consent.

UNDESIRABLE EMPLOYEES. 9. Any incompetent, disorderly or otherwise undesirable employees shall on request of the Engineer be dismissed and not again employed on this work.

INSPECTION OF MATERIAL. 10. All materials and supplies delivered at or near the site of the works are subject to inspection and if condemned at any time by the Engineer, shall be so branded, and shall upon demand be removed at once to a satisfactory distance.

11. No inspection of any work or materials shall constitute an acceptance of same prior to the full completion and final acceptance of the work to be done under this contract, and all work or materials rejected by the Engineer at any time prior to final acceptance shall be at once made good by the Contractor.

SUPERVISION OF WORK. 12. The Contractor must give this work his personal attention and at all times have a competent foreman, experienced in this class of work, on the ground, authorized to accept orders from the Engineer.

LOCATION. 13. The accompanying profiles and maps, together with

the stakes upon the ground, show the nearest approximation of the work in advance of actual construction. The Contractor should make a personal examination of the lines for the general character of the work, keeping in view the right of the Company to deviate from the exact position as shown.

WORK TO CON-
FORM TO LINES,
GRADES, ETC.

14. All work, during its progress and on its completion shall conform to the lines and levels given by the Engineer, and shall be built in accordance with the contract plan and directions given from time to time by him, subject to such modifications and additions as shall be deemed necessary by him during its execution; and in no case shall any work in excess of the requirements of the plans and specifications be paid for unless ordered in writing by him.

15. If there is anything in these specifications or in the plans or specifications as now or hereinafter furnished which is not clear and intelligible to the Contractor, he shall not proceed with such work so ordered until he shall have drawn the attention of the Engineer to the element of doubt or misunderstanding, in writing, and have had the same explained to him, but it is the duty of the Contractor to examine the plans and site of the work far enough in advance to anticipate any needed explanation, and he will not be granted extension of time for misunderstanding or failing to understand any instructions.

TEMPORARY
BRIDGES OR
CROSSINGS.

16. Whenever it is necessary to cross roads or railroads, the Contractor shall, at his own expense, provide suitable and safe bridges or other sufficient crossings for the accomodation of the travel on said roads; and shall maintain the

same in good and safe condition until the roads can be restored, when he shall remove all bridges and other temporary expedients, and restore said roads to a condition suitable for use, all to be satisfactory to the Engineer. The Contractor shall give reasonable notice to the owners of railroads and private ways before interfering with them. He shall provide watchmen, red lights and fences at his own expense, and take such other precautions as may be necessary to protect life and property; and shall be liable for all damage occasioned in any way by his act or neglect, or that of his agents, employees or workmen.

VALVES,
ETC.

17. All air valves, stop valves and blowoff valves and accessories and all distribution tees and pipes necessary for proper diversion of the water and all specials will be furnished by the Company to the contractor f.o.b. cars, Encinitas or Del Mar as the contractor may desire.

18. The contractor shall at his own expense convey the materials from the points where they are delivered by the Company and shall at his own expense store the same in the vicinity of the work. He shall be responsible for loss incurred or damage done to materials furnished by the Company from the time of their delivery until the work is accepted.

MATERIAL AND
WORKMANSHIP.

19. All material and workmanship is to be the best of the kind specified.

EXCAVA-
TION.

20. The Contractor will be required to dig all well holes or other special digging required for the particular kind of pipe to be installed.

PIPE. 21. The pipe used may be iron, steel, concrete, salt glazed, continuous stave or other pipe or combination of pipes suitable for the performance of the duty required, and must be of sufficient strength to withstand the pressure of a head fifty per cent (50%) greater than the head actually put upon it, and the leakage under working conditions shall not be at a greater rate than one cubic foot per twentyfour (24) hours for each three hundred feet of pipe.

SYPHONS. 22. The syphons shall be of a type of pipe suitable for the head to be carried, and may be reserved for installation by the Company.

EXTRA WORK. 23. Contractor shall make no claims for extra work unless the same shall be ordered by the Engineer and approved by the Board of Directors of the Company.

All claims for extra work must be filed with the Engineer by the 1st of the month following that in which the work is performed, and the contractor shall produce and allow inspection by the Engineer of all bills, statements and vouchers showing the quality, amount and cost of all material entering into such extra work.

GENERAL REQUIREMENTS. 24. In all the operations connected with the work herein specified, all City or town ordinances, and all laws controlling or limiting in any way the actions of those engaged on the works, or affecting the materials applied to them, must be respected and strictly complied with.

NO SPIRITUOUS LIQUORS. 25. The Contractor shall neither bring nor allow others to bring any spirituous or fermented liquor, or other

intoxicant, upon the grounds occupied for the prosecution of the work; neither shall he furnish nor allow others to furnish liquors or other intoxicant, to the workmen in his employ or to any person or persons in the vicinity.

26. Grounds in the vicinity of the work shall be maintained in a proper sanitary condition as directed by the Engineer, and the regulation of all camps in which employees are quartered must conform to the California State Law.

27. After the work is finished all materials, rubbish and debris shall be removed from the site, and the site cleaned up satisfactory to the Engineer.

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NOTICE TO CONTRACTORS.

1. Sealed bids for the furnishing and installing of pipe for Distribution Lines No. 1A, 2B, 2C, 2D and 2F will be received by the San Dieguito Mutual Water Company, at the office of its President, 920 Eighth Street, San Diego, California, until 10 o'clock, A. M., July 19th, 1917.

2. Each bid must be accompanied by a certified check in the sum of Two Thousand Dollars (\$2,000.00), payable to the San Dieguito Mutual Water Company. The check of each bidder to be retained until final award of the Contract and the execution and delivery of the latter. Failure of the bidder whose bid is accepted to execute and deliver construction contract within four days after notice of the acceptance of bid will entitle the Water Company to retain the check as liquidated damages for such failure.

3. A bond in the sum of fifty per cent of the estimated cost will be required for the faithful performance of the contract, such bond to be satisfactory to the officers of the Company.

4. The work is to be commenced within 10 days of the signing of the ~~contract~~, and continue with diligence until its completion. The entire work herein specified shall be completed on or before the 15th day of March, 1918.

5. Monthly estimates will be made of amount of work, and contractor will be paid 75% of said estimate on the 10th day of month following that in which the work is done. Balance will be paid 35 days after final acceptance of the work.

6. Bids must be made upon blanks to be furnished by the Company. Bidders will state unit prices for each item of the work,

by which the bids will be compared. These unit prices shall include the cost of setting gates or valves and tees with valves, furnished by the Company.

7. The bids to be compared on the basis of the Engineer's estimate of quantities which is as follows:

26"	- - - - -	6,390 lin.ft.
24"	- - - - -	6,645 lin.ft.
22"	- - - - -	6,865 lin.ft.
16"	- - - - -	5,692 lin.ft.

Pipe lengths for syphons and portions of syphons with not to exceed 40 foot head from hydraulic grade line.

26"	- - - - -	3,345 lin.ft.
24"	- - - - -	4,044 lin.ft.
22"	- - - - -	535 lin.ft.
16"	- - - - -	1,622 lin.ft.

Pipe lengths for portions of syphons in excess of 40 foot head from hydraulic grade line but not exceeding 120 foot head.

26"	- - - - -	1,120 lin.ft.
24"	- - - - -	2,525 lin.ft.
22"	- - - - -	none
16"	- - - - -	1,450 lin.ft.

On account of the character of the work to be done, quantities given above can not be estimated with accuracy; therefore, all bidders are required to submit their bids upon the following expressed conditions, viz: that they have satisfied themselves by personal examination of the location of the proposed work; and by such other means as they may elect as to the degree of accuracy of the foregoing estimates.

The Company reserves the right to increase or diminish the amount of the different classes of work as may be deemed necessary by its Engineer, to reject any or all bids in full or in part; or to accept, any bid in full, or in part, and may award the contract for one kind of pipe on grade contour, and another kind of pipe for

the Syphons if they deem it to their interest so to do.

The penalty for failure to complete the entire work by March 15th, 1918, will be One Hundred Dollars per day for the first fifteen days, One Hundred Fifty Dollars per day for the next fifteen days, and Two Hundred Dollars per day thereafter until the work is completed.

Upon notice to the Engineer (E.W. Case, 924 Eighth Street, San Diego, California, Telephone Pacific Main 2746) a representative will be available to conduct prospective bidders over the work. The nearest point of access is Del Mar, thence by automobile to the site.

SAN DIEGUITO MUTUAL WATER COMPANY

By _____

President.

San Diego, California,

June 28th, 1917

To the San Dieguito Mutual Water Company,
San Diego, California.

Gentlemen:

The undersigned propose to do all the work and furnish all material in accordance with the plans and specifications and notice to bidders, and upon the acceptance of this proposal to enter into a contract for furnishing and installing the pipe of Distribution Lines No. 1A, 2B, 2C, 2D and 2F at the prices named in the following schedule:

Pipe on grade contours (Kind of pipe)

26"	pipe-----	\$	per lin.ft.
24"	pipe-----	\$	per lin.ft.
22"	pipe-----	\$	per lin.ft.
16"	pipe-----	\$	per lin.ft.

Pipe for syphons and portions of syphons with not to exceed 40 foot head from hydraulic grade line.

(Kind of pipe)

26"	pipe-----	\$	per lin.ft.
24"	pipe-----	\$	per lin.ft.
22"	pipe-----	\$	per lin.ft.
16"	pipe-----	\$	per lin.ft.

Pipe for portions of syphon in excess of 40 foot head from hydraulic grade line but not exceeding 120 foot head.

(Kind of pipe)

26"	pipe-----	\$	per lin.ft.
24"	pipe-----	\$	per lin.ft.
22"	pipe-----	\$	per lin.ft.
16"	pipe-----	\$	per lin.ft.

Enclosed is a certified check for _____

Dollars, which sum is to be forfeited to the San Dieguito Mutual Water Company, if the party or parties making this proposal fail to enter into contract with approved securities within four days after the contract is awarded to said party or parties.

Respectfully,

1917

NOTE:- Each bid shall be placed in a sealed envelope addressed to Ed. Fletcher, President San Dieguito Mutual Water Company, 924 Eighth Street, San Diego, California, and shall be endorsed:

"Proposal for Furnishing and Installing
the pipe of Distribution Lines No. 2A, 2B,
2C, 2D and 2F."

Office Copy

100-A

S P E C I F I C A T I O N S

DISTRIBUTION LINES - 1A, 2B, 2C, 2D and 2F

NEAR DEL MAR, CALIFORNIA,

for

SAN DIEGUITO MUTUAL WATER COMPANY

===000===

SPECIFICATIONS

DISTRIBUTION LINES - 1A, 2B, 2C, 2D & 2F

NEAR DEL MAR, CALIFORNIA

FOR

SAN DIEGUITO MUTUAL WATER COMPANY.

--000--

GENERAL

DESCRIPTION.

1. The work to be done under these specifications consists of the construction of certain distribution lines of the works for the San Dieguito Mutual Water Company in the vicinity of Del Mar, California.

It is the object of these specifications to provide for all material (except air, stop and blow-off valves and tee connections and accessories as hereinafter specified), and all labor, plant and equipment necessary to build the pipe lines herein provided for.

2. Whenever the word "Company" or a pronoun in place of it is used, the same is understood to mean the San Dieguito Mutual Water Company. Whenever the word "Engineer" or a pronoun in place of it is used, the same is understood to mean the Chief Engineer of the said Company acting either directly or through his properly authorized agents. Such agents acting within the scope of the particular duties entrusted to them. Whenever the word "Contractor" or a pronoun in place of it is used, the same is understood to mean the person or persons or co-partnership or corporation engaged in the construction of the work herein

described as the party of the second part or his or their legal representative.

The contractor will commence the work herein required to be done within 10 days after the signing of the contract (unless the engineer shall authorize or direct a further delay) and at his own proper cost and expense and on or before _____
April 15th 1918 shall complete all the work and furnish all the labor, machinery, tools and materials except as herein specified, to do everything required to build and put in complete working order the several distribution pipe lines and appurtenant structures herein described.

3. The plans and specifications are intended to be explanatory of each other; but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained in either, the parties hereto further agree that the explanation and decision of the Engineer shall be final and binding on the Contractor; and all directions and explanations required, alluded to or necessary to complete any of the provisions of this contract and specifications, and give them due effect, shall be given by the Engineer. Correction of errors or omissions in drawings or specifications may be made by the Engineer when such correction is necessary for the proper fulfillment of the intention of such drawings or specifications, the effect of such correction to date from the time that the Engineer gives due notice thereof to said Contractor.

4. To prevent all disputes and litigation, the Engineer shall be referee, in all cases, to decide upon the amount, quality, acceptableness and fitness of the several kinds of work and mater-

ials which are to be paid for under this contract, and upon all questions which may arise relative to the fulfillment of the contract on the part of the Contractor, and his estimates and decision shall be final and conclusive; and such estimate and decision, in case any question shall arise, shall be a condition precedent to the right of said Contractor to receive any money under this agreement; also that said Engineer, by himself or by assistants or inspectors acting for him, shall inspect the materials furnished and the work done under this agreement, to see that the same strictly correspond with the specifications hereinafter set forth. And the Contractor also agrees that he will at all times give to the Engineer, his assistants and inspectors, tools and labor, and all facilities necessary for inspecting the materials furnished and the work done under this agreement.

5. The methods throughout this work shall conform to what is recognized as good practice for the particular style of construction herein contemplated.

6. The quantities of work to be done and materials to be furnished, as given in the accompanying "Notice to Contractors", are for the purpose of comparing, on a uniform basis, the bids offered for the work under the contract.

7. If an emergency demands, or if the Engineer deems it desirable, he may make alterations in the line, grade, plan, form, position, dimensions or material of the work herein contemplated, or of any part thereof, either before or after the commencement of construction. If such alterations diminish the quantity of work to be done, they shall not constitute a claim for damages, or for anticipated profits on the work that may be

dispensed with; if they increase the amount of work, such increase shall be paid for according to the quantity actually done and at the price established for such work under this contract; or, in case there is no price established, it shall be paid for at its actual reasonable cost, as determined by the Engineer, plus ten per cent of said cost.

8. All materials delivered at or near the site of the works are to be considered the property of the Company and cannot be removed without the Company's consent.

UNDESIRABLE EMPLOYEES. 9. Any incompetent, disorderly or otherwise undesirable employees shall on request of the Engineer be dismissed and not again employed on this work.

INSPECTION OF MATERIAL. 10. All materials and supplies delivered at or near the site of the works are subject to inspection and if condemned at any time by the Engineer, shall be so branded, and shall upon demand be removed at once to a satisfactory distance.

11. No inspection of any work or materials shall constitute an acceptance of same prior to the final acceptance of full completion of this contract, and all work or materials rejected by the Engineer at any time prior to final acceptance shall be at once made good by the Contractor.

SUPERVISION OF WORK. 12. The Contractor must give this work his personal attention and at all times have a competent foreman, experienced in this class of work, on the ground, authorized to accept orders from the Engineer.

LOCATION. 13. The accompanying profiles and maps, together with the stakes upon the ground, show the nearest approximation of

the work in advance of actual construction. The Contractor should make a personal examination of the lines for the general character of the work, keeping in view the right of the Company to deviate from the exact position as shown.

WORK TO CON-
FORM TO LINES,
GRADES, ETC.

14. All work, during its progress and on its completion shall conform to the lines and levels given by the Engineer, and shall be built in accordance with the contract plan and directions given from time to time by him, subject to such modifications and additions as shall be deemed necessary by him during its execution; and in no case shall any work in excess of the requirements of the plans and specifications be paid for unless ordered in writing by him.

15. If there is anything in these specifications or in the plans or specifications as now or hereinafter furnished which is not clear and intelligible to the Contractor, he shall not proceed with such work so ordered until he shall have drawn the attention of the Engineer to the element of doubt or misunderstanding, in writing, and have had the same explained to him, but it is the duty of the Contractor to examine the plans and site of the work far enough in advance to anticipate any needed explanation, and he will not be granted extension of time for misunderstanding or failing to understand any instructions.

TEMPORARY
BRIDGES OR
CROSSINGS.

16. Whenever it is necessary to cross roads or railroads, the Contractor shall, at his own expense, provide suitable and safe bridges or other sufficient crossings for the accomodation of the travel on said roads; and shall maintain the same in good and safe condition until the roads can be restored, when he shall remove all bridges and other temporary expedients,

and restore said roads to a condition suitable for use, all to be satisfactory to the Engineer. The Contractor shall give reasonable notice to the owners of railroads and private ways before interfering with them. He shall provide watchmen, red lights and fences at his own expense, and take such other precautions as may be necessary to protect life and property; and shall be liable for all damage occasioned in any way by his act or neglect, or that of his agents, employees or workmen.

CLEARING. 17. The ground must be cleared of all brush, shrubs or other trees for a distance of eight feet on both sides of the center line.

**VALVES,
ETC.** 18. All air valves, stop valves and blowoff valves and accessories and all distribution tees and pipes necessary for proper diversion of the water will be furnished by the Company to the contractor f.o.b. cars, Encinitas or Del Mar as the contractor may desire.

19. The contractor shall at his own expense convey the materials from the points where they are delivered by the Company and shall at his own expense store the same in the vicinity of the work. He shall be responsible for loss incurred or damage done to materials furnished by the Company from the time of their delivery until the work is accepted.

**MATERIAL
AND WORK-
MANSHIP.** 20. All material and workmanship is to be the best of the kind specified.

EXCAVATIONS. 21. Excavations will be classified as follows:

EARTH will include clay, sand, loam, gravel and all other earthy matter or earth containing loose stone or boulders

intermixed which do not exceed in size three cubic feet.

OTHER THAN EARTH will include all material excavated not classified as earth.

PIPE. 22. The pipe used ~~shall be iron, steel,~~ ^{shall be} concrete,

BACK-

FILLING.

~~solid pipe, suitable for the~~ ^{solid pipe suitable for the} ~~performance~~ 21-A. After the pipe has been laid and tested, the trench shall be back-filled to such points as determined by the Engineer and shall be paid for per cubic yard of trench actually filled. ~~conditions shall not be at a greater rate than one cubic~~ foot per twenty-four hours for each three hundred feet of pipe.

TUNNELS. 23. The tunnels shall be true to line and grade and of such size that there will be sufficient room for the proper placing of the pipe through the tunnel.

EXTRA
WORK.

24. Contractor shall make no claims for extra work unless the same shall be ordered by the Engineer and approved by the Board of Directors of the Company.

All claims for extra work must be filed with the Engineer by the 1st of the month following that in which the work is performed, and the contractor shall produce and allow inspection by the Engineer of all bills, statements and vouchers showing the quality, amount and cost of all material entering into such extra work.

GENERAL
REQUIREMENTS.

25. In all the operations connected with the work herein specified, all city or town ordinances, and all laws controlling or limiting in any way the actions of those engaged on the works, or affecting the materials applied to them, must be respected and strictly complied with.

NO SPIRITUOUS
LIQUORS.

26. The Contractor shall neither bring nor allow others to bring any spirituous or fermented liquor,

or other intoxicant upon the grounds occupied for the prosecution of the work; neither shall he furnish nor allow others to furnish liquors or other intoxicant, to the workmen in his employ or to any person or persons in the vicinity.

27. Grounds in the vicinity of the work shall be maintained in a proper sanitary condition as directed by the Engineer, and the regulation of all camps in which employees are quartered must conform to the California State Law.

28. After the work is finished all materials, rubbish and debris shall be removed from the site, and the site cleaned up satisfactory to the Engineer.

100-A
Office Copy

NOTICE TO CONTRACTORS

1. Sealed bids for the construction of Distribution Lines No. 1A, 2B, 2C, 2D and 2F will be received by the San Dieguito Mutual Water Company, at the Office of its President, 920 Eighth Street, San Diego, California, until 10 o'clock A.M., July 19th, 1917.

2. Each bid must be accompanied by a certified check in the sum of Two Thousand Five Hundred Dollars (\$2,500), payable to the San Dieguito Mutual Water Company. The check of each bidder to be retained until final award of the Contract and the execution and delivery of the latter. Failure of the bidder whose bid is accepted to execute and deliver construction contract within four days after notice of the acceptance of bid will entitle the Water Company to retain the check as liquidated damages for such failure.

3. A bond in the sum of fifty per cent of the estimated cost will be required for the faithful performance of the contract, such bond to be satisfactory to the officers of the Company.

4. The work is to be commenced within 10 days of the signing of the contract, and continue with diligence until its completion. The entire work herein specified shall be completed on or before the 1st day of April 1918.

5. Monthly estimates will be made of amount of work, and contractor will be paid 75% of said estimate on the 10th of month following that in which the work is done. Balance will be paid 35 days after final acceptance of the work.

6. Bids must be made upon blanks to be furnished by the

Company. Bidders will state unit prices for each item of the work by which the bids will be compared. These unit prices shall include the cost of setting gates or valves and tees with valves, furnished by the Company.

7. The bids to be compared on the basis of the Engineer's estimate of quantities which is as follows:

Excavation - Earth	- - - - -	11,120 cu.yds.
Other than earth	- - - - -	2,780 cu.yds.
Tunnels - Tunnel #1	- - - - -	410 lin.ft.
Tunnel #2	- - - - -	900 lin.ft.
Tunnel #3	- - - - -	1,175 lin.ft.

Pipe lengths for grade contours:

26"	- - - - -	6,390 lin.ft.
24"	- - - - -	6,645 lin.ft.
22"	- - - - -	6,865 lin.ft.
16"	- - - - -	5,692 lin.ft.

Pipe lengths for syphons and portions of syphons with not to exceed 40 foot head from hydraulic grade line.

26"	- - - - -	3,345 lin.ft.
24"	- - - - -	4,044 lin.ft.
22"	- - - - -	535 lin.ft.
16"	- - - - -	1,622 lin.ft.

Pipe lengths for portions of syphons in excess of 40 foot head from hydraulic grade line but not exceeding 120 foot head.

26"	- - - - -	1,120 lin.ft.
24"	- - - - -	2,525 lin.ft.
22"	- - - - -	none
16"	- - - - -	1,450 lin.ft.

Backfilling - - - - - 9,500 cu.yds.

On account of the character of the work to be done, quantities given above can not be estimated with accuracy; therefore, all bidders are required to submit their bids upon the following expressed condition, viz: that they have satisfied themselves by personal examination of the location of the proposed work; and by such other means as they may elect as to the degree of accuracy

of the foregoing estimates.

The Company reserves the right to increase or diminish the amount of the different classes of work as may be deemed necessary by its Engineer, to reject any or all bids; or to accept any bid should it be deemed to the interest of the Company so to do.

The penalty for failure to complete the entire work by April 1st, 1918, will be One Hundred Dollars per day for the first fifteen days, One Hundred Fifty Dollars per day for the next fifteen days, and Two Hundred Dollars per day thereafter until the work is completed.

Upon notice to the Engineer (E.W. Case, 924 Eighth Street, San Diego, California, Telephone Pacific Main 2746) a representative will be available to conduct prospective bidders over the work. The nearest point of access is Del Mar, thence by automobile to the site.

SAN DIEGUITO MUTUAL WATER COMPANY

BY Ed Fletcher
President.

San Diego, California,
June 28th, 1917

To The San Dieguito Mutual Water Company,
San Diego, California.

Gentlemen:

The undersigned propose to do all the work and furnish all material in accordance with the plans and specifications and notice to bidders, and upon the acceptance of this proposal to enter into a contract for installing Distribution Lines No. 1A, 2B, 2C, 2D and 2F at the prices named in the following schedule:

Excavation - Earth	-----	\$	_____	per cu.yd.
Other than earth	-----	\$	_____	per cu.yd.
Tunnels - Tunnel #1	-----	\$	_____	per lin.ft.
Tunnel #2	-----	\$	_____	per lin.ft.
Tunnel #3	-----	\$	_____	per lin.ft.

Pipe on grade contours (Kind of pipe)

26"	_____	pipe	---	\$	_____	per lin.ft.
24"	_____	pipe	---	\$	_____	per lin.ft.
22"	_____	pipe	---	\$	_____	per lin.ft.
16"	_____	pipe	---	\$	_____	per lin.ft.

Pipe for syphons and portions of syphons with not to exceed 40 foot head from hydraulic grade line. (Kind of pipe)

26"	_____	pipe	---	\$	_____	per lin.ft.
24"	_____	pipe	---	\$	_____	per lin.ft.
22"	_____	pipe	---	\$	_____	per lin.ft.
16"	_____	pipe	---	\$	_____	per lin.ft.

Pipe for portions of syphon in excess of 40 foot head from hydraulic grade line but not exceeding 120 foot head. (Kind of pipe)

26"	_____	pipe	---	\$	_____	per lin.ft.
24"	_____	pipe	---	\$	_____	per lin.ft.
22"	_____	pipe	---	\$	_____	per lin.ft.
16"	_____	pipe	---	\$	_____	per lin.ft.

Backfilling ----- \$ _____ per cu.yd.

Enclosed is a certified check for _____
Dollars, which sum is to be forfeited to the San Dieguito Mutual
Water Company, if the party or parties making this proposal fail
to enter into contract with approved securities within four days
after the contract is awarded to said party or parties.

Respectfully,

1917

NOTE:- Each bid shall be placed in a sealed envelope addressed to Ed. Fletcher, President San Dieguito Mutual Water Company, 924 Eighth Street, San Diego, California, and shall be endorsed:

"Proposal for the Installation of Distribution Lines No. 1A, 2B, 2C, 2D and 2F"

The Company reserves the right to reject any or all bids or to accept any bid.

SPECIFICATIONS FOR REINFORCED
CONCRETE PIPE

PIPE Shall be constructed of concrete reinforced with steel. It shall be made in sections not less than three feet in length, and so formed that when the sections are laid together and cemented they shall make a continuous and uniform line of pipe.

CONCRETE Used in the construction of pipe shall consist of the following mixture:
1 part of Portland Cement.
2 parts of sand.
3 parts of crushed stone or clean coarse gravel.
In determining quantities per batch, aggregates shall be dry when measured.

MORTAR used in making the joints shall be of the following mixture:
1 part Portland Cement.
2 parts clean sand.

MIXING All concrete shall be mixed by machine of the batch type. Materials shall be turned until the mass is of a uniform color; then water added sufficient to produce a mixture that will flow, and the whole mixed until of a uniform consistency.

PLACING The concrete shall be placed in the forms as quickly as possible after being mixed. The filling of forms shall be continuous and if for any reason the work is stopped long enough for the cement to take its initial set, any partly filled forms

shall be emptied. While the concrete is being placed in the forms it shall be thoroughly spaded to produce a uniformly dense concrete.

FORMS

Shall consist of iron or steel bottom and top rings and steel plates rolled to a true circle. The latter shall be reinforced, if necessary to prevent distortion while the concrete is being placed. Forms shall not be removed from the pipe before the cement has attained its final set. Joints between plates shall be tight to prevent leakage of concrete and plates shall be locked together in such a manner that the joint will be smooth without offset.

CEMENT

Shall be of some well-known and reputable brand of Portland Cement. It shall be properly stored in a dry, well ventilated place, and properly protected from the weather. Cement that has become lumpy in packages shall not be used. All cement shall fulfill the requirements of the revised and amended specifications of the American Society of Civil Engineers.

SAND

Sand shall be clean with well graded particles, shall not contain over five per cent of dust or dirt, and shall be free from oil, tar or organic matter.

SCREENED GRAVEL shall not contain over 5% of dirt or sand and shall pass a one inch ring. Natural mixture of sand and gravel may be used where same conforms to the above requirements.

REINFORCEMENT. The reinforcement shall consist of American Steel and Wire Company's triangular mesh or spirals of Bessemer Wire hard grade properly held in position by accurate spacers.

FINISHING
AND CURING.

As soon as the forms are removed from the pipe it shall be protected from the sun by burlap and kept wet for at least seven days. All pipe shall be marked showing the date of manufacture.

LAYING

Trench width must be not less than 10 inches greater than the outside **diameter** of the pipe. Trench bottom must be graded to conform to stakes, which will be set by the owner at least every 50 feet along the line. Ends of pipe must be clean before putting together and must be thoroughly wet just previous to cementing. The sections of pipe shall be tightly fitted together and the joints completely filled with mortar, and the inside joints shall be trowelled smooth.

Previous to setting, joints shall be protected from sun and wind by backfilling or otherwise.

SPECIFICATIONS FOR
PLAIN CONCRETE PIPELINES

GENERAL: The pipe shall be of the "taper joint" pattern, having both ends accurately moulded by iron rings, the socket end being formed on the bottom. It shall be made in not less than two-foot lengths. When making the pipe, care must be taken to keep the core centered so that the shell will be of practically uniform thickness. All workmanship shall be up to recognized best standards.

MATERIALS: Materials must be clean and good and suitable for the work. Sand shall be well graded from fine to coarse, and shall be free from vegetable matter, and shall contain not over 6% of dirt. Riverside Portland Cement shall be used. All pipe shall be made of Cement Concrete composed of one part (by measure) cement, to three parts of clean dry aggregates. The aggregates may be mixed sand and gravel or mixed sand and crushed rock. The sand and gravel, or sand and crushed rock shall be so proportioned to each other as to give the densest body compatible with a fairly smooth pipe. This will ordinarily be about 40% gravel or screened crushed rock, to 60% sand. Crusher run of rock, or natural mixture of sand and gravel may be used where same conforms to the above requirements.

MIXING: Mixing must be complete and thorough, and no water used until the dry mixture is of a uniform color throughout. Mixing may be done by hand or by machine. When machine is used it shall be a batch mixer of a type which will as nearly as possible discharge a dry batch without separating the stones. The dumping type is preferred. When hand mixing is employed it shall be done with hoes in a tight box and the materials shall be thoroughly hoed to alternate ends of the box at least three times dry, and at least two times wet. In this operation the "bite" shall be small enough so that the hoe rides on the bottom of the box for the full length of every draw stroke.

All concrete shall be mixed as wet as it is possible to make the pipe stand without distortion.

FEEDING: Feeding the concrete into the molds shall be uniformly and evenly done and at such a rate as to cause the tamper to make not less than four complete rounds for each linear foot of pipe.

In feeding, the concrete shall not be thrown into the molds in such a way as to cause the stones to separate and fly to the back of the mold, producing a rough or coarse section on that side of the pipe.

TAMPING: Shall be done with an iron tamper having a face not over five inches long, and a thickness of not over three-fourths of the thickness of the shell of the pipe. Tamper strokes must overlap each other sufficiently to insure no skipping. Tamping shall be continuous during the feeding and shall be vigorous and hard so as to produce a dense, tight pipe, containing no soft or uneven spots. In making the top or spigot end, sufficient concrete shall be piled on the top to require approximately 20 hard blows of the "top former" or "rimmer" to form the spigot. The tongue of the spigot end must be strong and dense.

SPECIFICATIONS NO. 2

- COATING:** A thick brush-coat of neat cement and water shall be put on the inside of the pipe. This coating must be dense and tough and after it is dry must set tight to the pipe so as not to rub off or powder under the hand when rubbed.
- WETTING:** All pipe must be kept wet for 7 days after making, and watering must be continuous during daylight. At least one man watering must be used for each "tamp". Special care must be taken to see that the pipe is kept as full of water as possible during the first day. It is the intent that all pipe shall not only be kept a dark color for the first week but shall be kept soaked through with water.
- PIPE LAYING:** Trench width must be not less than 10 inches greater than the outside diameter of the pipe. Trench bottom must be graded to conform to stakes, which will be set by the owner at least every 50 feet along the line. Ends of pipe must be clean before putting together and must be thoroughly wet just previous to cementing. Joint mortar shall be made of one part cement to two parts good clean sand thoroughly mixed dry and wet only as needed for immediate use. The method shall be to reduce the wetted mortar to the desired plasticity by thoroughly working rather than by a harmful flooding with water. The mortar must make a complete and unbroken collar around the entire joint on the outside.
- On pipe of a sufficient diameter for a man to work inside, a complete band of mortar shall be made on the inside of the joint with a trowel. These bands shall be left as smooth and flat as possible, to prevent obstruction of flow, but shall completely fill any gaps between the ends of the pipe. This inside work shall be done after the pipe has been firmly bedded by backfilling, or otherwise not sooner than 24 hours after the outside joint has been made. Joints must be thoroughly wet inside just before mortaring.
- Previous to setting, joints shall be protected from sun and wind by backfilling or otherwise.

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100-A

S P E C I F I C A T I O N S

for

TRENCHING AND BACK-FILLING

DISTRIBUTION LINES - 1A, 2B, 2C, 2D & 2F

Near Del Mar, California

for

SAN DIEGUITO MUTUAL WATER CO.

-----000-----

SPECIFICATIONS

for

TRENCHING AND BACK-FILLING

DISTRIBUTION LINES - 1A, 2B, 2C, 2D & 2F

Near Del Mar, California

for

SAN DIEGUITO MUTUAL WATER CO.

-----000-----

GENERAL

DESCRIPTION.

1. The work to be done under these specifications consists of the trenching for the installation of pipe and the back-filling after the pipe is laid of certain distribution lines of the works for the San Dieguito Mutual Water Company in the vicinity of Del Mar, California.

It is the object of these specifications to provide for all labor, plant and equipment necessary to excavate the trenches and tunnels and the back-filling required on the lines herein contemplated.

2. Whenever the word "Company" or a pronoun in place of it is used, the same is understood to mean the San Dieguito Mutual Water Company. Whenever the word "Engineer" or a pronoun in place of it is used, the same is understood to mean the Chief Engineer of the said Company acting either directly or through his properly authorized agents. Such agents acting within the scope of the particular duties entrusted to them. Whenever the word "Contractor" or a pronoun in place of it is used, the same is understood to mean the person or persons or co-partnership

or corporation engaged in the construction of the work herein described as the party of the second part or his or their legal representative.

The contractor will commence the work herein required to be done within 10 days after the signing of the contract (unless the engineer shall authorize or direct a further delay) and at his own proper cost and expense and on or before _____
April 1st 1918 shall complete all excavation required for the proper installation of the several pipe lines and accessories and do the necessary back-filling.

3. The plans and specifications are intended to be explanatory of each other; but should any discrepancy appear, or any misunderstanding arise as to the import of anything contained in either, the parties hereto further agree that the explanation and decision of the Engineer shall be final and binding on the Contractor; and all directions and explanations required, alluded to or necessary to complete any of the provisions of this contract and specifications, and give them due effect, shall be given by the Engineer. Correction of errors or omissions in drawings or specifications may be made by the Engineer when such correction is necessary for the proper fulfillment of the intention of such drawings or specifications, the effect of such correction to date from the time that the Engineer gives due notice thereof to said Contractor.

4. To prevent all disputes and litigation, the Engineer

shall be referee, in all cases, to decide upon the amount, quality and acceptableness and fitness of the several kinds of work which are to be paid for under this contract, and upon all questions which may arise relative to the fulfillment of the contract on the part of the Contractor, and his estimates and decision shall be final and conclusive; and such estimate and decision, in case any question shall arise, shall be a condition precedent to the right of said Contractor to receive any money under this agreement; also that said Engineer, by himself or by assistants or inspectors acting for him, shall inspect the work under this agreement, to see that the same strictly corresponds with the specifications hereinafter set forth. And the Contractor also agrees that he will at all times give to the Engineer, his assistants and inspectors, free access to and necessary facilities for the proper inspection of the work to be done under this agreement.

5. The methods throughout this work shall conform to what is recognized as good practice for the particular style of construction herein contemplated.

6. The quantities of work to be done, as given in the accompanying "Notice to Contractors", are for the purpose of comparing, on a uniform basis, the bids offered for the work under the contract.

7. If an emergency demands, or if the Engineer deems it desirable, he may make alterations in the line, grade, plan, form, position or dimensions of the work herein contemplated, or of any part thereof, either before or after the commencement of excavation. If such alterations diminish the quantity of work to be done, they shall not constitute a claim for damages, or for anticipated profits.

on the work that may be dispensed with; if they increase the amount of work, such increase shall be paid for according to the quantity actually done and at the price established for such work under this contract; or, in case there is no price established, it shall be paid for at its actual reasonable cost, as determined by the Engineer, plus ten per cent of said cost.

UNDESIRABLE EMPLOYEES. 8. Any incompetent, disorderly or otherwise undesirable

employees shall on request of the Engineer be dismissed and not again employed on this work.

9. No inspection of any work shall constitute an acceptance of same prior to the final acceptance of the full completion of this contract, and all work not satisfactory to the Engineer at any time prior to final acceptance shall be at once made good by the Contractor.

SUPERVISION OF WORK. 10. The Contractor must give this work his personal

attention and at all times have a competent foreman, experienced in this class of work, on the ground, authorized to accept orders from the Engineer.

LOCATION. 11. The accompanying profiles and maps, together with the stakes upon the ground, show the nearest approximation of the work in advance of actual construction. The Contractor should make a personal examination of the lines for the general character of the work, keeping in view the right of the Company to deviate from the exact position as shown.

WORK TO CONFORM TO LINES, GRADES, ETC. 12. All work, during its progress and on its completion

shall conform to the lines and levels given by the Engineer, and must conform to the contract plans and directions given from time to time by him, subject to such modifications and

additions as shall be deemed necessary by him during its execution; and in no case shall any work in excess of the requirements of the plans and specifications be paid for unless ordered in writing by him.

13. If there is anything in these specifications or in the plans or specifications as now or hereinafter furnished which is not clear and intelligible to the Contractor, he shall not proceed with such work so ordered until he shall have drawn the attention of the Engineer to the element of doubt or misunderstanding, in writing, and have had the same explained to him, but it is the duty of the Contractor to examine the plans and site of the work far enough in advance to anticipate any needed explanation, and he will not be granted extension of time for misunderstanding or failing to understand any instructions.

TEMPORARY
BRIDGES OR
CROSSINGS.

14. Whenever it is necessary to cross roads or railroads, the Contractor shall, at his own expense, provide suitable and safe bridges or other sufficient crossings for the accommodation of the travel on said roads; and shall maintain the same in good and safe condition until the roads can be restored, when he shall remove all bridges and other temporary expedients, and restore said roads to a condition suitable for use, all to be satisfactory to the Engineer. The Contractor shall give reasonable notice to the owners of railroads and private ways before interfering with them. He shall provide watchmen, red lights and fences at his own expense, and take such other precautions as may be necessary to protect life and property; and shall be liable for all damage occasioned in any way by his act or neglect, or that of his agents, employees or workmen.

CLEARING. 15. The ground must be cleared of all brush, shrubs or other trees for a distance of eight feet on both sides of the center line.

TRENCHING. 16. All trenches shall be of width and depth as determined by the Engineer and marked upon the ground by slope stakes. From these slope stakes the yardage will be computed and settlement made for the price agreed upon per cubic yard excavated.

BACK-FILLING. 17. After the pipe has been laid and accepted, the trench shall be back-filled to such points as determined by the Engineer and shall be paid for per cubic yard of trench actually filled.

EXCAVATIONS. 18. Excavations will be classified as follows:

EARTH will include clay, sand, loam, gravel and all other earthy matter or earth containing loose stone or boulders intermixed which do not exceed in size three cubic feet.

OTHER THAN EARTH will include all material excavated not classified as earth.

TUNNELS. 19. The tunnels shall be true to line and grade and of such size that there will be sufficient room for the proper placing of the pipe through the tunnel, but in no event shall they be less than 5' by 4' and may be any size up to 5' by 7' as the Contractor may elect.

EXTRA WORK. 20. Contractor shall make no claims for extra work unless the same shall be ordered by the Engineer and approved by the Board of Directors of the Company.

All claims for extra work must be filed with the Engineer by the 1st of the month following that in which the work is performed, and the contractor shall produce and allow inspection by the Engineer of all bills, statements and vouchers showing the quality,

amount and cost of all material entering into such extra work.

GENERAL
REQUIREMENTS.

21. In all the operations connected with the work

herein specified, all city or town ordinances, and all laws controlling or limiting in any way the actions of those engaged on the works, or affecting the materials applied to them, must be respected and strictly complied with.

NO SPIRITOUS
LIQUORS.

22. The Contractor shall neither bring nor allow

others to bring any spiritous or fermented liquor, or other intoxicant, upon the grounds occupied for the prosecution of the work; neither shall he furnish nor allow others to furnish liquors or other intoxicant, to the workmen in his employ or to any person or persons in the vicinity.

23. Grounds in the vicinity of the work shall be maintained in a proper sanitary condition as directed by the Engineer, and the regulation of all camps in which employees are quartered must conform to the California State law.

24. After the work is finished all equipment, rubbish and debris shall be removed from the site, and the site cleaned up satisfactory to the Engineer.

Office Copy

NOTICE TO CONTRACTORS

1. Sealed bids for the trenching and back-filling for the installation of Distribution Lines No. 1A, 2B, 2C, 2D and 2F will be received by the San Dieguito Mutual Water Company, at the Office of its President, 920 Eighth Street, San Diego, California, until 10 o'clock A. M., July 19th 1917,

2. Each bid must be accompanied by a certified check in the sum of One Thousand ^(1000.00) Dollars, payable to the San Dieguito Mutual Water Company. The check of each bidder to be retained until final award of the Contract and the execution and delivery of the latter. Failure of the bidder whose bid is accepted to execute and deliver construction contract within four days after notice of the acceptance of bid will entitle the Water Company to retain the check as liquidated damages for such failure.

3. A bond in the sum of fifty per cent of the estimated cost will be required for the faithful performance of the contract, such bond to be satisfactory to the officers of the Company.

4. The work is to be commenced within 10 days of the signing of the contract, and continue with diligence until its completion. The entire work herein specified shall be completed on or before the First day of April 1918.

5. Monthly estimates will be made of amount of work, and contractor will be paid 75% of said estimate on the 10th day of the month following that in which the work is done. Balance will be paid 35 days after final acceptance of the work.

6. Bids must be made upon blanks to be furnished by the Company. Bidders will state unit prices for each item of the work,

by which the bids will be compared.

7. The bids to be compared on the basis of the Engineer's estimate of quantities which is as follows:

Excavation	- Earth	- - - - -	11,120 cu. yds.
	Other than earth	- - - - -	2,780 cu. yds.
Tunnels	- Tunnel #1	- - - - -	410 lin. ft.
	Tunnel #2	- - - - -	900 lin. ft.
	Tunnel #3	- - - - -	1,175 lin. ft.
	Back-filling	- - - - -	9,500 cu. yds.

On account of the character of the work to be done,

quantities given above can not be estimated with accuracy; therefore, all bidders are required to submit their bids upon the following expressed conditions, viz: that they have satisfied themselves by personal examination of the location of the proposed work; and by such other means as they may elect as to the degree of accuracy of the foregoing estimates.

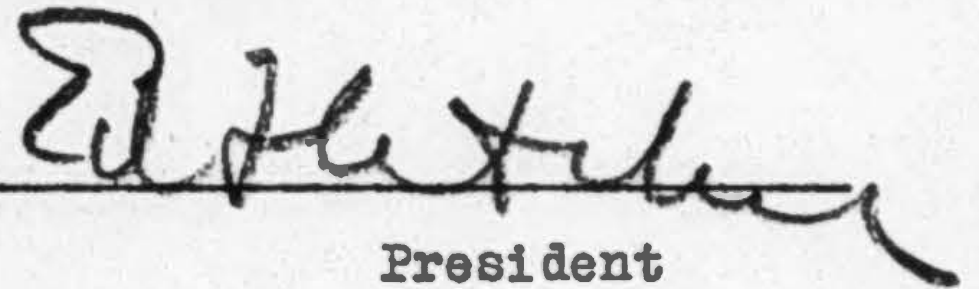
The Company reserves the right to increase or diminish the amount of the different classes of work as may be deemed necessary by its Engineer, to reject any or all bids; or to accept any bid should it be deemed to the interest of the Company so to do.

The penalty for failure to complete the entire work by April 1, 1918, will be One Hundred Dollars per day for the first fifteen days, One Hundred Fifty Dollars per day for the next fifteen days, and Two Hundred Dollars per day thereafter until the work is completed.

Upon notice to the Engineer (E. W. Case, 924 Eighth Street, San Diego, California, Telephone Pacific Main 2746) a representative will be available to conduct prospective bidders over the work. The nearest point of access is Del Mar, thence by automobile to the site.

SAN DIEGUITO MUTUAL WATER COMPANY

BY



President

San Diego, Calif.

June 28th 1917

Office Copy

To The San Dieguito Mutual Water Company,
San Diego, California.

Gentlemen:

The undersigned propose to furnish all equipment for and do all the work in accordance with the plans and specifications and notice to bidders, and upon the acceptance of this proposal to enter into a contract for Trenching and Back-filling for the installation of Distribution Lines No. 1A, 2B, 2C, 2D and 2F at the prices named in the following schedule:

Excavation - Earth	- - - - -	\$	_____	per cu.yd.
Other than earth	- - - - -	\$	_____	per cu.yd.
Tunnels - Tunnel #1	- - - - -	\$	_____	per lin.ft
Tunnel #2	- - - - -	\$	_____	per lin.ft
Tunnel #3	- - - - -	\$	_____	per lin.ft.
Back-filling	- - - - -	\$	_____	per cu.yd.

Enclosed is a certified check for _____

Dollars, which sum is to be forfeited to the San Dieguito Mutual Water Company, if the party or parties making this proposal fail to enter into contract with approved securities within four days after the contract is awarded to said party or parties.

Respectfully,

NOTE:- Each bid shall be placed in a sealed envelope addressed to Ed Fletcher, President San Dieguito Mutual Water Company, 920 Eighth Street, San Diego, California, and shall be endorsed:

"Proposal for the Trenching and Back-filling for the Installation of Distribution Lines No. 1A, 2B, 2C, 2D and 2F."

The Company reserves the right to reject any or all bids or to accept any bid.

Ed Fletcher Papers

1870-1955

MSS.81

Box: 47 Folder: 14

**Business Records - Water Companies - Volcan
Land and Water Company - San Dieguito System
- San Dieguito Mutual Water Company - Carroll
Conduit - Notice to Contractors and Specifications**



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UC SAN DIEGO

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