

JOHN P. RYAN  
CIVIL ENGINEER  
STATE LICENSED LAND SURVEYOR  
HAMILTON CITY

Sacramento Valley Irrigation Company,  
Willows, California

Mr. D. W. Ross, Gen. Mgr.  
Mr. E. C. Mills, Chief Engineer  
Mr. W. G. Davies, Asst. Engineer

HAMILTON, CAL.,

August 22nd, 1912.

Gentlemen:

Tests of some of the hand-made 1 to 4 CONCRETE PIPE now being made for you by the ARTHUR S. BENT CONSTRUCTION CO. of Los Angeles, were recently made under my direction and as you are interested, I am giving you herewith the results.

Test #1 was made on two joints of 18" pipe with both ends plugged with concrete and joined with the ordinary mortar joints. No further provision was made for holding the pipe together. At 40 lbs. the joints pulled apart without injuring the pipe in any way.

Test #2 was made on two joints of 18" pipe joined in the same way. To prevent the pipe pulling apart a 2x4 was placed at both ends and joined with two  $\frac{1}{2}$ " rods. The beam at the end in most cases rested upon the plug and not on the pipe, so that the pipe was not held together in any way at the end, and the results indicated that the plug at the end did not strengthen the pipe. This pipe was subject to a pressure of 35 lbs. for about an hour. During that time the water moistened several parts of the outside of the pipe but there was no leak. The pressure was then gradually raised to 60 lbs., when the pipe broke. The fracture was practically straight and extended clear across both joints. This pressure is equivalent to a head of 138 feet and the stress on the average section of the concrete was 250 lbs. per square inch.

Test #3 was made under similar conditions as in #2 but a 16" pipe was tested. The test lasted about 10 minutes. Two wet places appeared upon the pipe but there was no leak. At 55 lbs. the pipe broke. A crack appeared the full length of the pipe but twisted around the pipe almost 90 degrees. There were two smaller cracks radiating from a point in the main one at a point where a large smooth stone appeared. This pressure is equal to a head of 127 feet, the tensile stress on the concrete being 250 lbs. per sq. in.

Test #4 was made under similar conditions, the pipe being 10 inches in diameter. It remained absolutely dry until it broke at 70 lbs. This is equal to a head of 160 feet. The stress on the concrete was 255 lbs. per square inch. This pipe broke in several places and it is probable that there was some air in the pipe, as it sounded like a small explosion.

The pipes were about 12 days old with the exception of the 10", which I believe was about three weeks. I believe that the test of two joints in this way gives the strength of the pipe in the line fairly close. In a trench the pipe being supported on all sides may have a greater strength. The results indicate that Concrete Pipe of the quality which the Bent Company makes may be safely placed under pressure. I am preparing a longer report on this test and will see that you get a copy.

Yours very truly,

(Signed)

JOHN P. RYAN.

ARTHUR S. BENT CONSTRUCTION COMPANY  
CENTRAL BUILDING, LOS ANGELES

COPY

91-A

SAN DIEGO, CALIFORNIA, February 19, 1918

San Dieguito Mutual Water Co.,  
Col. Ed Fletcher, President,  
San Diego, Calif.

Dear Sir:-

Supplementary to our proposition of even date for steel flume and trestle, we will construct same complete for actual cost plus 10 percent and guarantee that the total cost, including our 10 percent, shall not exceed \$9.75 per lineal foot.

Yours very truly,

BENT BROTHERS,

HSB:BK

By H. Stanley Bent.



COPY

SAN DIEGO, CALIFORNIA, February 19, 1918

San Dieguito Mutual Water Co.,  
Col. Ed Fletcher, President,  
San Diego, Calif.

Dear Sir:-

We will install the metal flume and construct the substructure as per final plans for \$9.75 per lineal foot complete.

Or we will do the work for total cost plus 10 percent as provided in Clause 12 of the General Specifications (Exhibit B) for any work which is not covered by a price in our original bid.

Very truly yours,

BENT BROTHERS,

By H. Stanley Bent.

HSB:BK

GENERAL ESTIMATE OF CONDUIT.

Excavation	16991.4	Cu. Yds. Solid Rock @ \$2.00	=	\$33982.80
	3782.9	" " Loose " " 1.00	-	3782.90
	.3782.9	" " Earth " .40	-	1513.16
				<u>39278.86</u>
Open Conduit	12194.94	lin. ft. lined 3" Concrete @ 1.35	-	16463.17
		This \$1.35 price based on the bid of \$13.50 per cu. yd.		
Covered Conduit	1600.35	lin. ft. @ \$1.35 + 1.88-3.23	-	5169.13
		This \$1.88 price based on concrete at \$22.50 per cu. yd.		
42" Reinforced Concrete Pipe	3148.	lin. ft. @ \$5.00	-	15740.00
Trestle supporting siphon	279.	lin. ft. @ \$3.75	-	1046.25
Steel Flume on Concrete Trestle - Trestle including footings				\$3.75
		Flume		3.04
		Freight		.08
Steel Flume 1098 lineal feet				<u>6.87</u> - 7543.26
Inlet & outlet boxes	- 12.75	cu. yds. for both		
9 Siphons each requiring 12.75 cu. yds. for intakes & outlets	- 114.75	cy. yds. @ 22.50		.2581.88
Deep Section 1605	lin. ft. 3" Concrete @ 1.62		-	2600.10
"	" 1357 " " 3" " " 1.76		-	2388.32
"	" 1860 " " 3" " " 2.16		-	4017.60
"	" 1606 " " 3" " " 2.20		-	4536.20
				<u>101164.77</u>



FILE

B1  
C. W. CO.

June 23, 1913.

Arthur S. Bent Construction Co.

Central Bldg.,

Los Angeles, Cal.

Gentlemen:-

In answer to your inquiry of June 12th, as to bidding for reinforced concrete pipe, we hereby notify you that plans are ready to build 1220 lineal feet of 42" reinforced pipe syphon at Sand Creek, which is about 15 miles from Lakeside.

The job will be contracted to the lowest responsible bidder.

We will be pleased to meet you next Thursday (June 26th), at our office, 916 8th St. San Diego, at 8 or 9 A.M. Our representative will accompany you to the place of construction and all details can be obtained from him during the trip.

Wire us as to your arrival.

Very truly yours,

Chief Engineer.  
Cuyamaca Water Company.

EAB-WK

FILE

B2  
C. W. CO.

June 27, 1913.

Arthur S. Bent Construction Co.,

Los Angeles, Cal.

Gentlemen:-

I forward herewith a profile for 1220 linear ft. of 42 inch reinforced pipe syphon for the Cuyamaca Water Co. This syphon is located 15 miles from Lakeside upon ordinary wagon road.

This structure has not yet been authorized, but I anticipate immediate orders to proceed and therefore ask you to present a bid. I anticipate that construction can commence by July 15th and we should want to put it in service in three and one-half months. I suggest that figureing this job that you use a price of \$3.00 per barrel for cement as a basis. Gravel and sand are within one-half mile of the pipe line which is accessible to wagons.

We can arrange to take yourself or representative to the site. Notify me when you would like to do this.

Very truly yours,

Engineer.  
Cuyamaca Water Company.

San Diego  
Sunset Main 2746.

B



HUR S. BENT

H. STANLEY BENT

ESTABLISHED 1888

## ARTHUR S. BENT CONSTRUCTION CO.

GENERAL OFFICES, CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

CONCRETE PIPE LINES  
IRRIGATION SYSTEMS  
SEWERS  
CONDUITS  
RESERVOIRS  
TUNNEL LININGS  
DAMS  
BRIDGES  
CONCRETE CONSTRUCTION  
WEBER "MONOLITH" CHIMNEYS

DENVER, CENTURY BUILDING  
PHOENIX, ARIZONA  
SAN FRANCISCO, MONADNOCK BUILDING

June 12/13

Mr. W. S. Post,  
503 American Nat'l. Bk. Bldg.,  
San Diego, Cal.

Dear sir:-

Are you still in the market for a reinforced  
concrete water line?

We will be glad to quote prices on pressure  
lines, 18" to 60" up to 150 ft. head. Also gravity  
distributing systems.

Yours very truly,

ARTHUR S. BENT CONSTRUCTION CO.

*AS Bent*



ARTHUR S. BENT

H. STANLEY BENT

ESTABLISHED 1886

## ARTHUR S. BENT CONSTRUCTION CO.

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

CONCRETE PIPE LINES  
IRRIGATION SYSTEMS  
SEWERS  
CONDUITS  
RESERVOIRS  
TUNNEL LININGS  
DAMS  
BRIDGES  
CONCRETE CONSTRUCTION  
WEBER "MONOLITH" CHIMNEYS

DENVER, CENTURY BUILDING  
PHOENIX, ARIZONA  
SAN FRANCISCO, MONADNOCK BUILDING

July 8/13

Wm. S. Post, C.E.,  
514 Am. National Bank Bldg.,  
San Diego, Cal.

Dear sir:-

Your valued favor of the 27th ult. with enclosed profile was waiting for me on my return from an eastern trip and I hasten to reply that it will be impossible for me to figure with you on this work on account of the short time required for its construction.

In the near future we hope to be able to build pressure lines from 18" up to 60" under heads up to 150'.

In the meantime it might be interesting to you to visit our plant at 10th & M Sts., where we are making tamped concrete pipe, bell and spigot type, which are being tested up to 90 and 125 lbs. pressure. Mr. Vogt, our Supt. will be glad to explain things to you.

Thanking you for the inquiry, and hoping to be in shape to handle your future business in this line, I am

Yours very truly,

*A.S. Bent*

A.S.B.-H

P.S.--Shall we return profile?

*ASB*

C. W. CO.  
FILE

83

ARTHUR S. BENT

ESTABLISHED 1886

H. STANLEY BENT

## BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

SAN DIEGO, CALIFORNIA, February 19, 1918

San Dieguito Mutual Water Co.,  
Col. Ed Fletcher, President,  
San Diego, Calif.

Dear Sir:-

We will construct the San Dieguito Dam complete in accordance with the revised plan as approved by State Engineer McClure, down to a depth of 5 feet below the ground surface, for \$31,700.00.

Prices for excavation and extra concrete to be the same as in our proposition of January 21, 1918.

Yours very truly,

BENT BROTHERS,

By

*H. Stanley Bent*

HSB:HK

Feb. 20, 1917

The price of \$31,700.00 as above is our bid for the San Dieguito Dam instead of 31,900.00 as originally bid.

Bent Bros.

By H. Stanley Bent



PAGE \_\_\_\_ OF \_\_\_\_

**SERIES & FOLDER TITLE**

2D FLETCHER

BENT BROS

[illegible]

September 3, 1918.

Bent Brothers,  
Los Angeles, Calif.

Gentlemen:

This is to notify you that in accordance with your bid dated July 30, 1918, which reads as follows:

"San Diego, California,  
July 30th, 1918.

San Dieguito Mutual Water Co.,  
Col. Ed Fletcher, President,  
San Diego, California.

Dear Sir:-

We beg to submit a bid of 40 cents per square yard for placing the Gunitite Coat on the San Dieguito and Lake Hodges Dams, under the following conditions:

We will furnish and transport all equipment, scaffolds, air compressor and pipe necessary for the proper performance of the work.

We will furnish an expert gun operator, a compressor engineer and two men for mixing material. The Water Company to furnish and deliver sand and cement as required on a mixing board at the gun, and to furnish water at the gun. Delivery of materials to be in quantities requisite for the maximum gun output.

Work to start when ordered by you, and to continue without interruption other than the time required for transferring plant to the Lake Hodges Dam, until both dams are coated. Should any delay occur through the fault of the Water Company, or their agent, we shall receive the sum of \$30 for each day that we are prevented from working after our plant is ready to operate.

No preparation of the surface to be coated is included in the above figure and any cleaning, sand blasting, excavation of material or unwatering will be performed by the Water Company so that we will have a clean and satisfactory surface to work upon.

It is understood that the total surface in the two dams is 7,948.62 square yards and our price is based on this quantity. Should the amount be lessened for any reason we are to receive a sum of two cents per square foot for the surface not coated. That is, for the difference between the surface coated and 7,948.62 square yards.

If the Water Company so desires, we will fulfill its part of the above proposition on the following basis:

We will furnish necessary water delivered at the gun, for two cents per square yard of surface gunned. We will also furnish necessary teams and men for delivering all sand required for the work from the nearest source where suitable material can be gotten and cement from nearest railroad point, and do any excavation, or other preparatory work, which may prove necessary, for actual cost plus 10%.

Very truly yours,  
BENT BROTHERS,  
H. Stanley Bent."



Bent Brothers,  
Page 2.

And your alternative bid of August 2nd, 1918, which reads as follows:

"San Diego, California, August 2, 1918,

San Dieguito Mutual Water Co.  
Col. Ed Fletcher, President,  
San Diego, Cal.

Dear Sir:-

As an alternative to our proposal to furnish materials required for guniting Lake Hodges and San Dieguito Dams for actual cost plus 10 percent, we hereby propose to furnish and deliver sand and water at the gun and deliver at the gun cement furnished by you from nearest railway point for 25 cents per square yard of surface gunited.

Yours very truly,  
BENT BROTHERS,  
H. Stanley Bent."

The San Dieguito Mutual Water Company accepts the alternative bid of 65 cents per square yard of surface gunited, 3/4" thick.

The price of 65 cents per square yard includes the cost of all materials, (excepting cement), hauling cement from the nearest railroad station, all labor and machinery required to properly perform the operation and the placing of the Gunite coat; but does not include the cost of preparation of the surface to be coated either by cleaning or sand blasting nor any excavation of material or unwatering.

Payment will be made in full on or before the 10th of the month next succeeding the completion to the satisfaction of the Engineer for the Company of the Guniting on each dam.

SAN DIEGUITO MUTUAL WATER COMPANY,

By \_\_\_\_\_  
President

Attest:

\_\_\_\_\_  
Engineer

\_\_\_\_\_  
Secretary

80-A  
EXHIBIT "D"

To be attached to contract dated May, 1917, by and between Bent Brothers and the San Dieguito Mutual Water Company, for the building of the Carroll Dam, and Carroll Conduit in San Diego County.

The schedule of prices for said work is agreed to be as follows:

FOR CARROLL DAM, MULTIPLE ARCH TYPE

Excavation - Earth	\$0.40	cents	per	cubic	yard
" - Loose Rock	\$1.00	"	"	"	"
" - Solid Rock	\$3.00	"	"	"	"
Plain Concrete 1:2 $\frac{1}{2}$ :5	\$7.36	"	"	"	"
Reinforced Concrete 1:2:4	\$11.27	"	"	"	"

CARROLL CONDUIT

Excavation - Earth	\$0.40	cents	per	cubic	yard
" - Loose Rock	\$1.00	"	"	"	"
" - Solid Rock	\$2.00	"	"	"	"
Steel Flume, Concrete Trestle	\$5.75	"	"	Lin. ft.	
Reinforced Concrete Flume including supports	\$6.00	"	"	"	
42" Reinforced Concrete pipe	\$5.00	"	"	"	
Concrete Lining 1:2:4 maximum size 3/4" open conduit 3" thick	\$13.50			per	cubic yard
Cement Plaster 1:3 not to exceed 1" in thickness	\$ 0.30	cents	per	square	yard
Reinforced Concrete 1:2:4 with not over 1% steel	\$22.50			per	cubic yard

If road is built adjacent to canal before Sept. 1, 1917

our price for open conduit will be \$12.50 per cu.yd.



February 25, 1918.

Bent Brothers, Contractors,  
Attention Mr. H. Stanley Bent,  
Escondido, Calif.

Gentlemen:

In conformity to the requirements of paragraph 12, Exhibit B of your contract, you are hereby notified that your proposition of February 19th as follows, that you will construct the substructure and install the Metal Flume as per final plans for actual cost plus 10 percent and guarantee that the total cost, not including cement, which is furnished by the Company, but including your 10 percent, shall not exceed \$9.75 per lineal foot, has been accepted and you are authorized to begin the said construction at your convenience and to prosecute the same to its ultimate conclusion.

Yours very truly,

---

President

---

Engineer

December 16, 1919.

Bent Bros.,  
Central Building,  
Los Angeles, Calif.

Gentlemen:--

Under separate cover, we are sending you profile of a portion of the line from the San Dieguito Mutual Water Company system to La Jolla. You will note that after leaving the small city reservoir, there is about 15,500 feet of line which will be under a 50-foot head or less. This is the portion of which Colonel Fletcher spoke to you.

The pipe will be buried and require a 2' clearance above the pipe. The location is across the mesa at the top of the Torrey Pine grade coming toward the Biological Station and the alignment is almost perfectly straight; no sharp ends of any character.

It will require 18" pipe, the specifications being the same as for the siphon for the distribution line which you built across the Syndicate Lands.

THK:K

Yours truly,

P.S. According to present plans, the Company will dig the ditch, you to do sufficient back-filling to protect the pipe and the Company will complete the back-filling.



ARTHUR S. BENT

ESTABLISHED 1886

H. STANLEY BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

December 24, 1919.

Col. Ed. Fletcher,  
Fletcher Building,  
San Diego, Cal.

Dear Sir:

We will make and lay your proposed 15,000 ft. Reinforced Concrete Pipe extending from the top of Torrey Pines' grade across the Mesa to the Biological Station grade, for \$2.30 per lin. foot.

This price is for 20" instead of 18", as 18" is too small to permit inside work and we consider that essential in making a success of pressure lines. Probably the additional capacity will be of some advantage to you.

Reinforcement is figures as follows:

For 30' head or less	7 coils	$\frac{1}{2}$ " wire per 3 ft section
" 30' to 50' head	11 coils	$\frac{1}{2}$ " " " " "
" 50' to 70' head	15 coils	$\frac{1}{2}$ " " " " "

The above price is based on pipe being made at Sorrento, or Linda Vista, or any R.R. point in that vicinity you may select where materials can be shipped without a switching charge and where we can have sufficient ground on which to make the pipe adjacent to a Railroad siding so that there will be no handling of material other than unloading from the cars to the ground.

It will also be necessary to have water under pressure at the point of making, we to pay for what we actually use.

We leave the matter of pipe yard location to you so you may select a point from which you can haul most cheaply. In that connection (you will be glad to know) that the weight of 20" pipe is approximately 170 lbs per ft and we will make it in 3 ft sections.

Our price is for making and laying the pipe exclusive of hauling and trench work.

Yours truly,

BENT BROTHERS

*H. Stanley Bent*

HSB:K

ARTHUR S. BENT

ESTABLISHED 1886

H. STANLEY BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

February 4, 1920.

Col. E. Fletcher,  
Fletcher Building,  
San Diego, Cal.

Dear Sir:

In connection with your proposed pipeline from Del Mar to La Jolla, we will make you the following propositions:

We will rent you our Buckeye Trench Machine for \$50.00 per working day, plus loading and transportation costs both ways. This price includes all costs of operating the machine except the sharpening of the teeth.

Or we will excavate that portion of the trench lying between your warehouse at Del Mar and the tide flat below Torrey Pines, a distance of approximately three miles, for ten cents per lineal foot.

The trench ~~is to~~ have a maximum width of 34" and a maximum depth of 7 ft with an average depth of 4 ft. It is to be understood that this price does not include trench where rock exists that the machine cannot cut. In such cases if you wish to loosen the ground with powder so that the machine can operate, we will excavate the loosened material at the same price per lin. foot as above.

It is also understood that we do not excavate in water or below water plane. Also that all clearing of brush and removal of fences or poles, or any other obstructions which would prevent the passage of the machine, shall be cleared and removed by you.

Apparently none of these conditions will apply on the upper three miles unless possibly the one referring to rock.

The above price and conditions will apply also to the flat between the Biological grade and the La Jolla hill.

On the mesa between Torrey Pines and the Biological grade, approximately three miles in length, the top 2 ft of soil is easy enough but in a 4 ft trench the bottom would be in very hard material. We have shown a sample of this material to our trench machine operator and he says that there is some doubt in his mind as to whether the machine can cut it unless it is shaken up with powder. There seems to be thin layers of very hard material embedded in the sandstone and whether or not the machine would cut these layers, would depend upon the position in which they lie. If they presented a flat, horizontal plane, the machine might ride on top of them without cutting thru. On the other hand, if the layers were vertical or somewhat pitched, we could probably cut thru. We can cut thru sandstone if it isn't too hard, and our belief is that we can probably cut this La Jolla Mesa but it will of course go slowly, and is evidently about



Feb. 4, 1920.

our limit. If we can cut it at all, the machine will make anywhere from 300 to 400 ft per day and if there were any sections of this mesa where we did not get into the sandstone, we would dig two or three times that amount. It is so much of a gamble that we do not feel justified in giving you a per foot price, but if you wish to have us do the other portions of the line which are suitable for our trench machine at the above unit price, we will be glad to put the machine on the job and will rent it to you by the day for the La Jolla Mesa section and it can be used on that portion of the line to whatever extent proves a saving over any other method of excavation.

Our machine will not be available for your work for from six to eight weeks, but this will probably be in ample time for your requirements.

Yours truly,

BENT BROTHERS

*H. Stanley Bent*

HSB:K

February 6, 1920

Mr. Stanley Bent,  
c/o Bent Bros.,  
Central Bldg.,  
Los Angeles, Calif.

Dear Sir:--

Under separate cover, I am sending you to-night plans and specifications for the 3 million reservoir to be built for the city at the top of Torrey Pines grade. The distance, as near as I can get it, from the siding to the reservoir is approximately two miles.

Yours truly,

THK:K



ARTHUR S. BENT

ESTABLISHED 1886

H. STANLEY BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING

LOS ANGELES, CALIFORNIA

February 24, 1920.

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

Mr. Thomas H. King,  
Care of Col. Ed. Fletcher,  
San Diego, Cal.

Dear Mr. King:

Have just received today a report from Williams regarding proportions to be used on La Jolla reservoir. He says they have decided on a 1:5 mix which is about what you get when you use one cement, two sand and four rock; so we will figure that way and if there is any change of proportions, as the report indicates there may be, we will expect to be reimbursed in case there is any extra cement used. The cost of the aggregates is so nearly the same that it doesn't matter much what the proportions are between sand and rock.

Shall we go ahead now and figure on that basis and send our bid to you, and how soon would you like to have it?

When you write will you please tell me, if you know, how much Lake Hodges raised during the last storm. Thanking you,

Yours truly,

BENT BROTHERS

*H. Stanley Bent*

ARTHUR S. BENT

ESTABLISHED 1886

H. STANLEY BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING

LOS ANGELES, CALIFORNIA

March 5, 1920.

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

Mr. Thomas H. King,  
Fletcher Building,  
Care of The Fletcher Co.,  
San Diego, Cal.

Dear Sir:

Confirming our telephone conversation, we will construct your proposed La Jolla Reservoir for the following prices:

Excavation including grading on floor- 60¢ per cu. yd.  
Backfill around the reservoir- 25¢ per c.yd.  
The Reservoir itself including the installing of all sub-drains and outlets, but not including roof, roof supports, or aerating chamber -  
for - - - \$30,000.00

This price is on the basis of omitting the hydrated lime. If 5% of lime is added, the increased cost will be \$500.00.

Yours truly,

BENT BROTHERS

*H. Stanley Bent*



March  
Sixteenth  
1 9 2 0

Bent Brothers,  
Central Building,  
Los Angeles, Calif.

Gentlemen:

We signed up the contract yesterday  
with the City and will want your trenching  
machine, either on one basis or another. When  
will you be ready to come down with your crew?

Yours very truly,

EF:KIM

ART. 1 R BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

ESTABLISHED 1886

## BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

H. STANLEY BENT

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

March  
Seventeenth  
1 9 2 0

Colonel Ed. Fletcher,  
Fletcher Building,,  
San Diego, California.

Dear Sir:

Replying to your letter of March 16th,  
regarding our trench machine, would say that it  
is tied up for the present on a job near Whittier.  
The frequent rains here have delayed its operations  
so that it will be some little time before it is free  
to go to San Diego..

From talking with Mr. King, I judge that it  
would be perhaps several weeks before ~~it~~ <sup>we</sup> would actually  
have pipe ready to lay and it seems to me quite certain  
that our machine will be available by the time you  
really need it.

We will rush the job at Whittier, and if you  
will let us know exactly what date you must have the  
machine for trench, will meet that date as nearly as  
we possibly can.

Yours very truly,

BENT BROTHERS

*H. Stanley Bent*



ARTHUR BENT

ESTABLISHED 1886

H. STANLEY BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

March 22, 1920.

Col. Ed. Fletcher,  
920--8th St.,  
San Diego, Cal.

Dear Sir:

It is impossible at this time to set an absolute date when our excavator will be free to go to San Diego. The recent frequent rains have prevented our making any headway up to date. If the weather remains fair, we should finish present job in three weeks at the very longest. We will make it as much quicker as we can and trust this will be soon enough to meet your needs.

Yours truly,

BENT BROTHERS.

By

*H. Stanley Bent*

HSB/TCT

ARTHUR BENT

ESTABLISHED 1886

H. STANLEY BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

March 26, 1920.

Thos. H. King,  
Fletcher Bldg.,  
San Diego, Cal.

Dear Mr. King:

Just received your letter of the 25 and blue prints of the proposed reservoir. We have taken on considerable work since we figured on this first design and are hardly in position to bid at this time. I will mail the plans back to you or bring them next trip I make if you are not in a hurry.

I talked with Col. Fletcher yesterday morning about the trench machine and told him what I had previously written him, which was that if the weather remained fair we could finish the job where the machine now is in about three weeks. He admitted that he would not need it for two weeks but wanted to be sure he could get it in about that time. I presume that if it is actually on the job by the latter part of April it will be soon enough for your actual needs. At any rate we are crowding the proposition where it now is all we possibly can and will ship the machine to you at the earliest possible date.

We are surely pleased over the water at Lake Hodges. It has rained again since I wrote your letter and I suppose it would not be surprising to have the lake finish this year at up around ninety feet and that ought to make everybody happy.

Thank you for giving us an opportunity to bid on La Jolla and if you are in a hurry to have the plans returned, please advise us.

Yours truly,

BENT BROTHERS.

By

*H. Stanley Bent*

HSB/TCT



March 30, 1920

Mr. Stanley Bent,  
C/o Bent Bros.  
Central Building,  
Los Angeles.

Dear Sir:-

It is absolutely imperative that we get that excavator down here immediately. Do you know of any other one that we can get?

Please wire me definite and earliest possible date that you can make shipment of excavator.

Yours very truly,

BSB/bm

ARTHUR BENT

ESTABLISHED 1886

H. STANLEY BENT

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING

LOS ANGELES, CALIFORNIA

April 28, 1920.

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

Mr. Thos. H. King,  
Fletcher Building,  
San Diego, Cal.

My Dear Mr. King:

The situation as to our trench Machine is bad. I enclose two photographs which I took yesterday that will show you the conditions better than I can write them.

The machine is standing in the middle of a stretch a mile long, all of which is on a hill side as shown in the picture. It is impossible to back out over the dug trench, and we can't go ahead until 1500 ft of bench is completed. We were misled as to conditions at the time the machine went on to this stretch which was several weeks ago, or we would never have gotten ourselves tied up in the way we are. Of course all we can do now is to rush the completion of the bench and as the force at work on this ~~and~~ not our own, we can't control it as we could if we were doing it ourselves. However I spent the forenoon there yesterday with the owner and his engineer and I certainly put it to them pretty strong. I insisted that they take all the stock off of the rest of the project and concentrate them on this bench work. This they agreed to do and we have instructed our representative on the ground to follow them up and see that they keep their promise.

The nearest estimate we can make as to how long this bench work will take, is five days. That would be Sunday night and we could probably get the machine down out of the hills and to La Mirada on the Santa Fe by Tuesday, which would land it in Del Mar possibly on Wednesday morning, but more likely on Thursday morning of next week.

We certainly regret the delay but the situation is such that it is impossible for us to do a thing. Our hands are tied.

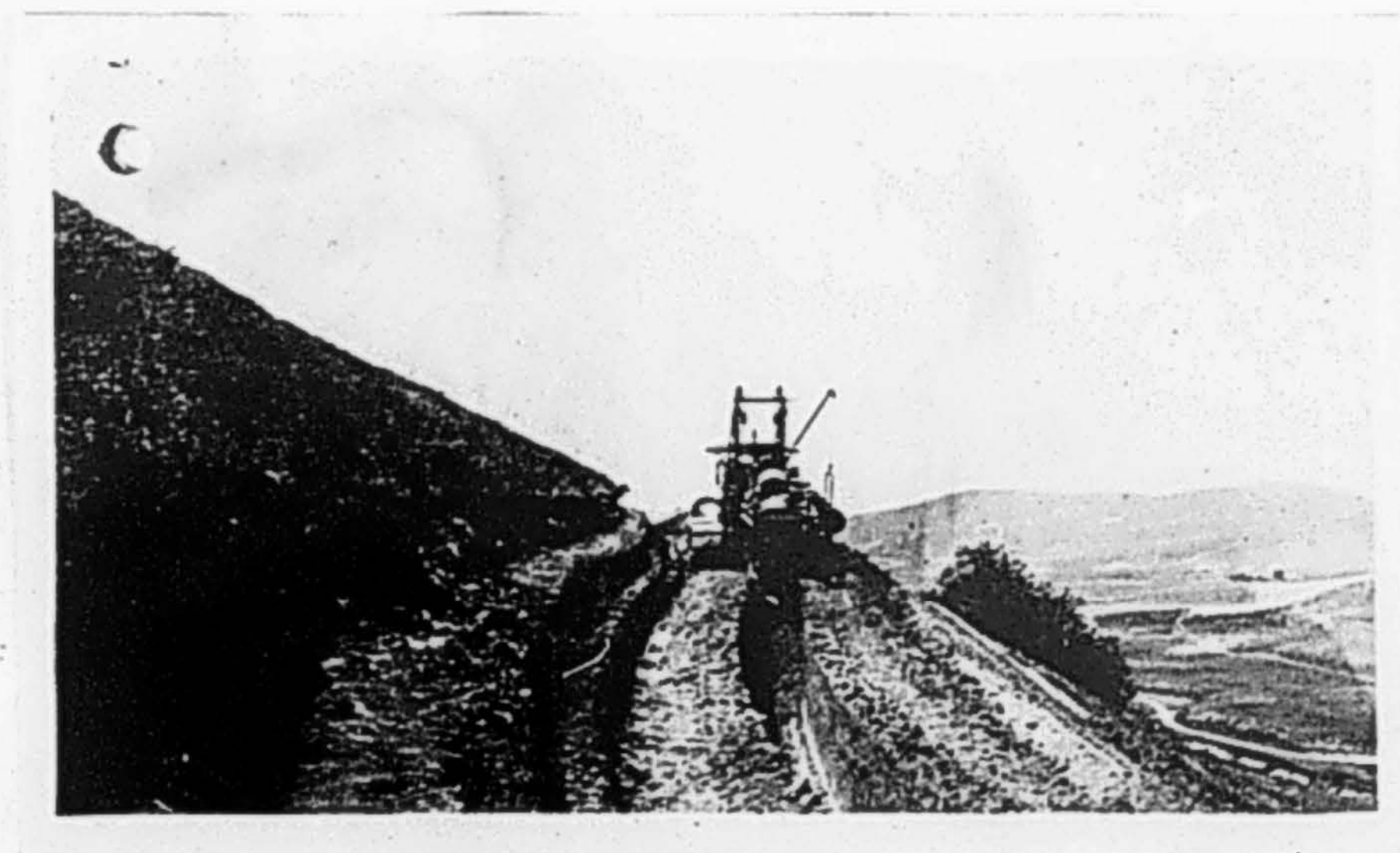
Yours very truly,

BENT BROTHERS

*H. Stanley Bent*

HSB:K  
CC:O.E.F.





ARTHUR BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS

ESTABLISHED 1886

# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

April 30, 1920.

H. STANLEY BENT

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

Mr. Thos. H. King,  
Fletcher Building,  
San Diego, Cal.

Dear Mr. King:

The report I got last night from Whittier is that they are making good progress and may possibly gain one day's time, which would mean that the bench would be completed Saturday night. In case it is not, they will work full blast Sunday and take their Sunday on Monday.

I really don't expect them to make it by Saturday night, but I do feel now that there is no doubt about their making good on their original estimate of Sunday night.

Will report to you again later.

Yours truly,

BENT BROTHERS

*H. Stanley Bent*

HSB:K



ARTHUR BENT

ESTABLISHED 1886

H. STANLEY BENT

CONCRETE PIPE LINES  
CONDUITS  
IRRIGATION SYSTEMS  
CONCRETE SILOS  
TUNNEL LININGS  
SUBWAYS



# BENT BROTHERS ENGINEERING CONTRACTORS

GENERAL OFFICES: CENTRAL BUILDING  
LOS ANGELES, CALIFORNIA

April 18th, 1921.

CONCRETE CHIMNEYS  
DAMS  
RESERVOIRS  
MACADAM ROADS  
CONCRETE ROADS  
ASPHALT PAVEMENTS

Colonel Ed. Fletcher,  
920 8th St.,  
San Diego, Calif.

Dear Colonel Fletcher:-

Replying to your inquiry of April 7th, our estimates on your proposed dam on the San Diego River,  $1\frac{1}{2}$  miles above the old Mission, are as follows:

Multiple arch type 1:2:4 reinforced concrete -	\$18.00 -
per cubic yard. Plain 1:2:5 concrete	13.50
" " "	"

On the Jorgensen constant angle type - \$10.00 per cu. yard for all concrete.

These prices are based on your statement that there is sufficient satisfactory sand at the dam site, also sufficient water for construction purposes, and suitable rock adjacent to the dam which can be quarried and crushed for concrete. Also that there is approximately 41,000 cu. yards of concrete in the multiple arch type and 75,000 cu. yards in the Jorgensen type.

The above prices are for concrete only and do not include excavation.

Yours very truly,

BENT BROTHERS.

*H. Stanley Bent*

September 21, 1922.

Mr. Arthur S. Bent,  
Central Building,  
Los Angeles, California.

My dear Mr. Bent:

I have heard from several sources, and you told me yourself, that I tried to get Fenton the job of building Lake Hodges Dam. You are mistaken in this matter. I had no reason for helping Mr. Fenton get the job from you, anyway you had the contract at the time I wrote. I did have every reason in the world for helping Bent Bros. get the job. Fenton has never bought a dollar's worth of powder from us, has never given us a dollar's worth of business, and Bent Brothers have been our friends in business for years.

The only thing I ever did, at the request of Mr. Fenton, while Fenton was in my office, I dictated a letter to Mr. Treanor, a copy of which is herewith enclosed relative to renting certain machinery or stock.

I wish you would show this letter to your brother, Stanley Bent, for I want to be put right with both of you in this matter, and my letter of May 24th in no sense can be construed as anything but a desire to help Mr. Fenton rent his steam shovels or his stock, and it was at Mr. Fenton's suggestion that I made reference to the fact that Fenton was even willing to undertake a sub-contract if you had it in mind.

Yours very sincerely,

EF:KLM



BENT BROTHERS, INC.

ESTABLISHED 1886  
ENGINEERING CONSTRUCTION  
418 SOUTH PECAN STREET  
LOS ANGELES

ARTHUR S. BENT, PRESIDENT  
H. STANLEY BENT, VICE PRES. & GEN. MGR.

February 12, 1931

Colonel Ed Fletcher,  
1020 Ninth St.,  
San Diego, Calif.

My dear Colonel Fletcher:

I am back from Chicago and have been looking over the plans you sent me for the Jorgenson dam at Mission Gorge.

I find I made an estimate for you several years ago on a dam in that general vicinity and I am surprised to note that you say there will be only 15,500 yards of concrete. This dam with its two auxiliary arches is quite a structure and I can't understand the small amount of concrete.

We built one in Oregon, which was much smaller, not so high, and only about 20 feet thick at the base which required over 16,000 yards. Are you sure you are right in this quantity?

At the time I made the other estimate I based it on your letter which stated that sand was available at the site and rock close by, which would have to be quarried and crushed. Is that the situation on the present job, or can we get coarse aggregates delivered from some existing plants cheaper than we can produce them ourselves. Opening up a quarry for a small job is always an expensive proposition and runs the cost per yard pretty high. Hadn't I better get a delivered price on rock and sand from some firm in San Diego, or don't you want any one to know about it at this time? At the time I made the old estimate you said the haul from railroad spur on cement would be about 5 miles. Is this location the same that you contemplated before and is the railroad delivery point still the same?

We will have to have information on the above, particularly on the coarse aggregates before I can give you a very intelligent estimate, so I will delay making any figures until I hear from you further.

Yours very truly,  
*H. Stanley Bent*

SF

Renewed interest in Mission Gorge No.

3 as the logical location for a dam on the San Diego River is evidenced by the visit of the City Council, members of the Water Committee of the Chamber of Commerce and others, inspecting the single arch type of dams built or under construction by the city of Los Angeles.

These include the highest dam in the world, the Pacoima Dam near San Fernando built by Bent Brothers, 365 feet in height at a cost of two and a half million.

The construction of the Santa Anita Dam, eight miles from Azusa, 240 feet in height, costing a million, two hundred thousand dollars and the big Tujunga dam, now under construction 240 feet in height, costing approximately a million dollars.

Judge Conkling, General Kuhn, Paul Edwards of the "Sun" and Colonel Fletcher made a recent inspection of the three dams and took photos of same which are herewith reproduced.

~~The question at issue is whether or not to build at Mission No. 2 or 3 and what type of dam.~~

Colonel Fletcher has urged the construction of a single arch type at Mission No. 3.

Bent Brothers who built the Pacoima Dam addressed a letter dated March 12th, 1931 to the Water Committee of the Chamber of Commerce, of vital interest to the City, reading as follows:



"In 1921 writer made estimate of cost of two types of dams at Mission Gorge No. 3 known as the lower site. I have personally investigated this site today again and after examining the surveys, cross sections, core drilling records, etc., I am convinced that Mission Gorge No. 3 is the ideal site for a single arch type of dam similar to the Pacoima Dam, the highest dam in the world and built by our firm.

There is now under construction the same type of dam, 443 feet in height on the Drag River in Switzerland.

We have re-checked our estimates on the basis of today's cost of materials and we are willing to take a contract to build Mission Gorge No. 3 dam as follows:

115,000 yards of concrete in place @ \$7.50 a yard	\$862,500.00
20,000 yards of excavation @ \$2.85 a yard	<u>67,000.00</u>
	\$919,500.00

We estimate the cost of spillway,

Independent of dam on southside, -	<u>\$250,000.00</u>
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TOTAL COST	\$1,169,500.00
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This covers the cost of a dam in Mission Gorge No. 3, 230 feet in height and an estimated cost for spillway entirely independent of the dam, adequate to carry major floods. Should a siphon spillway be preferable, the \$250,000.00 allowance for gravity spillway would be applicable for constructing the syphons.

I have never seen a more ideal site for the location of a dam of this type. The core drillings show splendid bed rock and all conditions, from a construction standpoint are the best.

Yours very truly,  
BENT BROTHERS, INC.

By H. STANLEY BENT

Colonel Fletcher stated:

Certainly Mission Gorge No. 3 should be given serious consideration and is a factor in determining the development of San Diego River as the cheapest water in the county that can be developed by the city.

Forty-seven of the single arch type in the west of dams have been built/the last fifteen years, five by the U. S. Government, three by the city of Los Angeles and fifteen between 240 and 365 feet in height.

Mr. Savage opposes Mission No. 3 for he recommends only a gravity arch type of dam and his type would cost three to three and a half million dollars according to the estimates he has furnished, 230 feet in height at Mission No. 3 while for approximately a million to a million and a quarter a single arch type can be built that will be satisfactory to the state authorities and approved by seven or eight of the most famous engineers in the west.

If the dam is going to be built on the San Diego River the first dam in the interest of the taxpayer should be built at No. 3.

The cost of a dam 230 feet high and lands flooded will only be a million and a half dollars, will get a net safe yield of eight million gallons daily under present conditions, the water will be stored where it belongs and will have a storage of 45,000 acre feet or 15 billion gallons comparable only to Morena, Barrett and Otay. The cost of the water will not exceed five or six cents a thousand gallons.



It makes no difference to me what dam is built first on the San Diego River but it is criminal, in my opinion, to build Mission No. 2 under any condition both from the standpoint of the taxpayer's pocketbook and the conservation of water.

In making my estimate of a million and a half dollars for the dam and reservoir lands I am adding \$100 an acre to the estimate of Mr. Savage for lands not yet acquired.

With a settlement with the district the city will have complete control of the San Diego River, no private interests will be involved and I am of the opinion that the single arch type which has higher factors of safety than the gravity arch can be built at No. 3, San Vicente and El Capitan, as needed, with the cost less than the whole of No. 2 for the entire project, with an additional six million gallons a day net safe yield that will be lost by evaporation if No. 2 was built and the vital factor favoring No. 3, San Vicente and El Capitan is that you can develop this plan, step by step, covering the next ten or fifteen year period as the town grows, saving the over-burdened taxpayer interest and sinking fund on four or five million dollars that would be immediately invested by the building of No. 2 if that plan was approved. Not alone that but millions would be saved in interest as well.

March Twelfth,  
1 9 3 1

Exhibit

1  
Write in

Water Committee,  
Chamber of Commerce,  
San Diego, California.

Gentlemen:

In 1921 I made estimates of cost of two types of dams at Mission Gorge No. 3, known as the lower site. I have personally investigated this site today again and after examining the surveys, cross sections, core drillings records, etc., I am convinced that Mission Gorge No. 3 is the ideal site for a single arch type of dam similar to the Fawcett Dam, the highest dam in the world and built by our firm.

There is now under construction the same type of dam 443 feet in height on the Drag River in Switzerland.

We have rechecked our estimates on the basis of today's cost of materials and we are willing to take a contract to build Mission Gorge No. 3 dam as follows:

115,000 yards of concrete in place @ \$7.50 a yard	\$862,500.00
20,000 yards of excavation @ \$2.85 per yard	57,000.00
Construction of spillway independent of dam on south side, estimate cost	60,000.00
TOTAL COST	\$979,500.00

This covers the cost of a dam in Mission Gorge No. 3, 230 feet in height with a spillway entirely independent of the dam.

I have never seen a more ideal site for the location of a dam, of this type. The core drillings show splendid bed rock and I hope some day to have the privilege of building same.

Sincerely yours,

BERT BROTHERS

By Stanley Bent



BENT CONSTRUCTION COMPANY

ESTABLISHED 1886  
ENGINEERING CONSTRUCTION  
5359 VALLEY BOULEVARD  
LOS ANGELES 32

H. STANLEY BENT

H. STANLEY BENT JR.



March 7th, 1950.

Col. Ed Fletcher,  
San Diego, Cal.

Dear Col. Fletcher:

Your friendly and very kind letter of March 1st with picture of the "57 varieties of Fletchers" enclosed received and very much appreciated. I know how proud you must be to head such a remarkable and wonderful a family. You certainly should be, for I doubt very much if it could be equalled very many times in the whole United States.

I am sending you herewith a book gotten out many years ago by my brother Arthur showing pictures and giving briefly the pertinent facts about the dams we had built up to 1930, which includes all the dams built by us that you were connected with.

Our biggest dams were constructed after the publication of the book. Later we built Morris Dam for the City of Pasadena, a \$3,000,000.00 job, Conchas Dam in New Mexico for the Army Engineers, a \$5,500,000.00 job, the great Friant Dam in the San Joaquin Valley for the Bureau of Reclamation, a \$11,000,000.00 job. Friant was finished in 1942, and was the last dam that I had direct charge of. Two years after its completion I had my stroke and I haven't been active since. I am very fortunate in having a very fine and a very capable son to carry on our business, and he is making a good job of it, for which I am very grateful.

I thought we bid on Murray Dam, but I had a search made of our old estimates today and we couldn't find any

BENT CONSTRUCTION COMPANY

ESTABLISHED 1886  
ENGINEERING CONSTRUCTION  
5359 VALLEY BOULEVARD  
LOS ANGELES 32

H. STANLEY BENT

H. STANLEY BENT JR.



figures on that job, although I am quite sure that <sup>we</sup> bid on it. So I can't help you out on that one. The only thing I remember is that Sharp & Fellows were the contractors who built it.

I enclose a fairly recent picture as per your request. You don't need to return it. I am very much interested to know that you are writing your memoirs, and would appreciate having a copy when published, because it should make very interesting reading. Your life has been such a full one, with so many worthwhile accomplishments

Thanking you for your letter, and with kind personal regards,

Cordially yours,

*H. Stanley Bent*



**Ed Fletcher Papers**

**1870-1955**

**MSS.81**

**Box: 2 Folder: 11**

**General Correspondence - Bent Brothers  
Construction Company - Arthur S. and H. Stanley**



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