

7/11
May 25th, 1921.

Mr. W. R. Hearst,
137 Riverside Drive,
New York City, N.Y.

Dear Mr. Hearst:

Your telegram of the 24th after receiving estimate of pipe line covered so many points it seemed best to write rather than trust to explain by wire.

The very least work that could be done this year to be of any use to you would be the pipe line from Big Springs to Hill 1818 Reservoir "C". This line will cost approximately \$18,500.00.

Starting at Big Springs there will be approximately 1500 feet of 4" pipe, then 3" pipe to Marmalejo ridge where standpipe will be located for air relief. From Marmalejo Ridge there will be approximately 1000 feet of 4" pipe and then 3" pipe to Reservoir "C" on Hill 1818. The 4" pipe acts in a similar manner to a funnel forcing the water into the 3" pipe as if the line were all 4" pipe it is apt to become air-bound.

Reservoir "C" on Hill 1818 we have found, after careful calculations based on the available quantity of water and the use to which water will be put, that a reservoir 60 ft. by 35 ft. by 7 ft. deep will answer all the requirements. It will take 20 hours for the spring to fill this reservoir. We are figuring on a concrete reservoir sunk in the ground below the surface of the hill. The cost of the reservoir we have estimated at \$5200.00.

From this point on, as you say, there are different things that could be done. There is a question of what you wish most for this year's service from the water. Mr. Phillips calculates that if the pipe is carried directly from Reservoir "C" on Hill 1818 to the present water power plant and the waterwheel be made as efficient as possible, you would only have as a result twice the electricity you have last year, and the cost of the pipe line from Reservoir "C" to the present water plant would be \$10,950.00 and for the change of the water wheel \$1500.00. [However, this would not be sufficient for the new houses as we have our water heaters, the ice plant and all the interior lighting fixtures to take care of as well as the motion picture machine when that is desired.]

If you take the pipe line this year from Reservoir "C" to the hilltop for irrigation, this would materially decrease the amount of electricity that would be obtainable. As far as the houses go, with no construction working going on this summer, you would have water enough for domestic purposes from the spring that has heretofore furnished the water for the camp. How much we would have for the garden work is not certain but by being careful we think it might suffice.

The cost of the pipe line from Reservoir "C" on Hill 1818 to the Camp would be \$5,260.00, using two inch pipe.

Mr. Phillips explains that there are only so many things which determine the amount of electricity to be had from a given amount of water as per the following formula: HP from stream equals

$$\frac{\text{Number of cu.ft. per min.} \times \text{Effective head} \times 62.3 \text{ lbs}}{33,000}$$

and no matter how many intermediate plants were put in between, the result would be only the same amount of electricity but increasing the cost by

the cost of the number of extra plants. Mr. Lee says the present plant run by water power cost somewhere in the neighborhood of \$10,000.00, when originally put in.

The length of the line from Reservoir "C" to Reservoir "B" (upper farm reservoir) is 3425 feet and cost would be approximately \$7500.00.

There is not enough difference in the height between the Camp and Reservoir "B" to provide useful power. If the swimming pool tank is used as a reservoir and the line is carried from the tank to Reservoir "B" (upper farm reservoir) there will be no more power obtained than you have at the present time.

As regards the water from the fountains, we can use the plunge as a reservoir and recirculate by a small pump up through the fountain system using the same water indefinitely by running it through a filter just as we do in all ordinary swimming pools. This would be comparatively very inexpensive. If on the other hand the pool is used as a reservoir and connected directly to Reservoir "B" (upper farm reservoir) you would not be gaining anything in the amount of electricity than is provided by the present water-power plant.

Careful calculation has developed that 3" pipe will carry all the water that can be obtained from Big Springs, and the use of 4" pipe is explained above.

The houses are piped for water from the spring which has always supplied the camp and the grounds will be piped to receive water from the new line from Reservoir "C". For this summer we can hook the two systems together if you desire to use all the water for developing electric power.

My own conclusion is that you will never have electricity enough from water power to take care of Las Estrellas needs in a manner which will be satisfactory to you. On the other hand, the water brought over to Las Estrellas will give you all needed for camp planting, fountains and swimming pool and the available surplus will materially aid the ranch house plantation.

Mr. Phillips says the segregated figures for costs of the various parts of the pipe line only apply if the work is all done at one time, as contractor's overhead expense would be practically the same for each unit as for the entire pipe line ~~xxx~~ installation.

We are holding the pipe on option until this letter can reach you.

Yours truly,

(Sgd) Julia Morgan

F

Dictated to Mr. Fairchild
and signed by him for me

pipe { 12,875.50
fringe { 882.00
\$13,697.50

18,500 -
5200.
10950
1500
\$ 5260
41,410.00