Tr. Thomas P. Elis, Engineer,
Tolan Lend \& Hater Co.. letaher Bldg. San Diego, California.

## Dear Sirs

Answering your savor of yesterday, in regard to $42^{\prime \prime}$ and $34^{\prime \prime}$ reinforced concrete pipe for your proposed upper and lower conduit.

When in San Diego on the 29th of last month, we figured on $42^{n}$ and $30^{n}$ pipe. We can furnish $42^{n}$ and 35" pipe, but have no forms for $34^{\prime \prime}$ pipe.

Kindly advise us if you can use the 88" pipe, and also the beads to which this pipe would be subjected in order that we may figure the reinforcement required. Te understand that only portions of the pipe mould be subjected to much head. If you can state the lengths approximately, of the pipe required for the different heads, it will be of assistance to us in giving you a odoser approximation to the cost of the pipe.

WसB/G

Yours very truly,
Western Re inforced Concrete Pipe Co.

wislam pi fired a one pere Co

$$
5 \text { mite. gro }
$$

make $H_{\mu}$
yamaha water 0 company Sen Diego, California

## Sentlemons

## Attention Col. Bd. Fletcher

Te propose to make and lay for you near El Cajun, California 1300 lineal feet of 39 inch reinforced concrete pipe, replacing a flume with an inverted siphon at $\$ 5.95$ per lineal foot.

You ane to famish 211 materials for concrete for the making and laying of said pipe. The required amount of materials 111 be 400 barrels of cements. 125 conb10 yards of sand and 150 oublo yards of rock, $1 / 4^{\mathrm{N}}$ to $3 / 4^{\mathrm{M}}$.

You aye to furnish us making ground at a point selected by us in the rio init of the proposed work end al so to furnish ns water under presume. Yon are to furnish and maintain a trench to a tiro grade and do all necessary back-fililing after the pipe has been Laid, wrench to be maintained free from water:

The pipe shell be made with a mixture of one part of Portland ament to two parts of sand and three parts of rook or gravel. Who re intorocment shall be malficiont to wi thitand the pressure He to the heads show on the profile submitted to ne. All steel To bo Bright Bessemer Round Wire having en elastic limit of 18,000 to 80,000 pound s. The maxim wortaing stress shall be 16,000 pounds, Look bare and tie bani shall be yessed in the mamfacture of the pipe.
The pipe shall be laid within forty working days after receiving your order. Our venal year guarantee shall be furnished you.

Pours very truly.
WIESIETET REIITRORCED COKCREMS PIPE COMPANY



Western Reinforced Conorote Pipe Co. Sixth \& Utah Sts. Los Angoler, Calif.

Gentilemen:-
Attention IFr. Brier:
Please koep in mind that we vant the heaviest reinforcod pipe made first. This is only a suggestion.
$\mathrm{EF} / \mathrm{bm}$

## Laying Reinforced Concrete Pipe

$\qquad$

## To Engineers and Contractors:

Reinforced concrete pipe is easi ${ }_{1}$ mand economically laid than bell-end pipe, either cement or vitrified.

Reinforced concrete pipe is cylindrical in shape and can be rolled and handled from trucks to the trench at less expense than a pipe having a projecting bell.

Bell-end pipe takes up more room in the trench on account of the projecting bell. The bottom of the trench must be gouged to receive the bell. If too little excavation is made to receive the bell, the pipe will ride on the bell end and is likely to be broken at the neck of the bell. If too much excavation is made to receive the bell, the weight of the earth covering in the trench will be carried by the bell of the pipe without any support underneath. Removing earth in the bottom of a trench is expensive and it is almost impossible to get accurate work.

When reinforced concrete pipe is laid, the poured joints will be waterproof. If the joints are not pointed correctly on the inside, you will know it at once when you come to pour the joints on the outside. You can be satisfied with your job when it is done and know that you won't have to come back and make good any defective work.

Concrete shrinks in setting. The band joint used in laying reinforced concrete pipe shrinks closer to the pipe. The mortar used in laying bell-end pipe shrinks away from the inside surface of the bell, causing it to leak:

You will find enclosed complete Laying, Handling, Loading and Hauling Instructions, and approximate estimates of the cost of laying reinforced concrete pipe. We shall be pleased to furnish additional copies of these instructions upon request.

> Yours very truly,

WESTERN REINFORCED CONCRETE PIPE COMPANY.


Los Angeles, California

## Cost of Hauling Reinforced Concrete Pipe for Culverts, Storm Drains and Sewers

Five Ton Trucks with Five Ton Trailers should be used where the haul is over four or five miles.

Contracts for hauling can usually be made, over good roads, at the following rates. Prices include loading and unloading and responsibility for damage to the pipe:

- ) 3 Hauling two to five miles, $\$ 1.00$ to $\$ 1.25$ per ton Hauling five to seven miles, $\$ 1.25$ to $\$ 1.50$ per ton Hauling seven to ten miles, $\$ 1.50$ to $\$ 2.00$ per ton Hauling ten to fifteen miles, $\$ 2.00$ to $\$ 2.50$ per ton
We have contracted hauling from Los Angeles to Long Beach, 22 miles, at $\$ 1.90$ per ton. Los Angeles to Santa Monica, 17 miles, at $\$ 2.00$ per ton. Los Angeles to Walnut, 26 miles, for $\$ 2.50$ per ton. These prices are for hauling over good roads, but include loading and unloading.


## Cost of Laying Reinforced Concrete Pipe for Culverts, Storm Drains and Sewers

Cost of laying reinforced concrete pipe, including cost of handling from alongside trench into the trench, laying the pipe, cost of materials and labor for making the joint varies according to location, quantity of pipe, etc.
The cost of laying reinforced concrete pipe is proportional to the diameter of the pipe. We have found this true for all practical purposes for all diameters.

The cost per foot of laying reinforced concrete pipe will be between one cent per inch of diameter and two cents per inch of diameter. For example. The extremes of laying cost for $36^{\prime \prime}$ inch pipe would be between 36 cents and 72 cents per lineal foot of pipe. These costs have been the extremes during our experience of several years.

If there is a straight run of at least 500 to 1000 feet, the laying cost should no be over $11 / 2$ cents per inch of diameter, and we consider it safe to estimate that a reasonable profit can be made at that price.

If all conditions are against you, and, for example, if you are to lay a short culvert or several culverts at a considerable distance from each other, the cost might mount to 2 cents per inch of diameter.

The above estimates are based on the pipe being delivered close to the trench. No excavating or backfilling is included in the above estimates.

WESTERN REINFORCED CONCRETE PIPE COMPANY.
Los Angeles, California.

## LAYING INSTRUCTIONS FOR LAYING REINFORGED CONGRETE PIPE

The sections shall be laid with spigot or collar ends towards the outlet.
If pipe is to be used for sewers, culverts, or storm drains, the reinforcement will be placed elliptically in the pipe and the letter " $T$ " will be stencilled on the inside of the pipe, indicating that part of the circumference of the pipe which should be placed either at the top or the bottom in the trench.

If a derrick is to be used to lay the pipe, the laying hook should take hold of the pipe either at the letter "T"" or directly opposite. If a derrick is not to be used, the pipe should be rolled in the trench until the letter " $T$ " is either uppermost or at the bottom and then the pipe should be shoved endwise into place, using bars.

If Lock Bars and Tie Bands are used in the pipe, the Tie Bands should be placed in the joint so that it will pass through all the hooks of the Lock Bars.

All joints should be carefully pointed on the inside with cement mortar which should be allowed to set before the joint is poured on the outside. A trustwoithy man should be employed for this purpose, because if the joint is not properly pointed on the inside, the joint can not be poured successfully on the outside.

A joint shield should be placed around the pipe at the joint and the joint thoroughly flushed with water. The joint shield may be of two ply roofing paper, cut in strips of width sufficient to fully cover the joint. Six inches in width is sufficient except for pipe having a greater diameter than 48 inches. If galvanized iron shields are used, these should be recovered or pulled within two hours after the joint is poured, and the shields should then be thoroughly cleaned. If roofing paper is used, the shields need not-berecovered, and pouring of joints can proceed up to the end of the working day, thus avoiding overtime work for men recovering shields.

Earth should be tamped around the pipe at the joint to hold the shields tightly against the pipe to prevent leakage. Grout, mixed one part of cement to two parts of clean sand, can then be poured in the joint and the shields left in place until the grout has set. Care must be used to completely fill the joint with grout. Pouring should be done from one side of the pipe and the grout permitted to rise on the other side of the pipe by gravity, thus insuring complete filling of the joint. A flexible rod should be worked in the joint to eliminate voids. The portion of the joint at the top of the pipe may be plastered with mortar of a drier consistency.

[^0]WESTERN REINFORCED CONCREIE PIPE $C 0$.
Los Angeles, California ready been unloaded. Skids should be used for unloading pipe. Care should be used in unloading so
that pipe will not strike together. A plank or piece of board should he placed in an
upright position, leaning against the pipe that has been unloaded, so that if a pipe
should get beyond control on the skids, it will not damage the pipe that has al
ready been unloaded. (3) $(x \sqrt{\infty})$ әđ!̣d әप7 шәәм7
 Pipe should never stand on end on a truck. A truck having high speed is not deexcept that only one row in width can be hauled. Since two 60 -inch pipe, in four
foot lengths, weigh 4.97 tons, the full capacity of the truck can be easily obtained. Four foot lengths of pipe should be rolled on to the truck in the same manner,
except that only one row in width can be hauled. Since two 60 -inch pipe, in four yond the three-foot length. Pipe should be securely blocked on the trucks. The extra width is made necessary on account of the extra length of the collars, being across the truck, which will require a truck about six feet four inches in width.
 foot lengths. The pipe, being a true cylinder, without projecting bell, can be rolled and hand-
led easily. The pipe is made in three foot lengths except for diameters greater than
60 inches, which are in lengths of four feet. Sixty-inch pipe is made in three or four REINFORCED CONCRETE PIPE

## INSTRUCTIONS FOR HAULING AND HANDLING

COST PER FOOT OF PIPE FOR HAULING

| SIZE | $\begin{aligned} & \text { WEIGHT PER } \\ & \text { FOOT. } \end{aligned}$ | $\begin{aligned} & \text { AT } \$ 1.00 \\ & \text { Per ton. } \end{aligned}$ | $\begin{aligned} & \text { AT } \$ 1.25 \\ & \text { Per ton. } \end{aligned}$ | $\begin{gathered} \text { AT } \$ 1.50 \\ \text { Per ton. } \end{gathered}$ | $\begin{gathered} \text { AT } \$ 1.75 \\ \text { Per ton. } \end{gathered}$ | $\begin{aligned} & \text { AT } \$ 2.00 \\ & \text { Per ton. } \end{aligned}$ | $\begin{aligned} & \text { AT } \$ 2.50 \\ & \text { Per ton. } \end{aligned}$ |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $12^{\prime \prime}$ | 90 lbs. | \$ \$0.05 | \$0.06 | \$0.07 | \$0.08 | \$0.09 | \$0.11 |
| $16^{\prime \prime}$ | 132 lbs. | \$0.07 | \$0.08 | \$0.10 | \$0.11 | \$0.13 | \$0.16 |
| 18" | 146 lbs . | \$0.08 | \$0.09 | \$0.11 | \$0.13 | \$0.15 | \$0.19 |
| $20^{\prime \prime}$ | 157 lbs. | \$0.08 | \$0.10 | \$0.12 | \$0.14 | \$0.16 | \$0.20: |
| $22^{\prime \prime}$ | 188 lbs. | \$0.10 | \$0.12 | \$0.14 | \$0.17 | \$0.19 | \$0.24 |
| $24^{\prime \prime}$ | 200 lbs . | \$0.10 | \$0.13 | \$0.15 | \$0.18 | \$0.20 | \$0.25 |
| $27^{\prime \prime}$ | 290 lbs. | \$0.15 | \$0.18 | \$0.22 | \$0.26 | \$0.29 | \$0.36 |
| $30^{\prime \prime}$ | 355 lbs. | \$0.18 | \$0.23 | \$0.27 | \$0.32 | \$0.36 | \$0.45 |
| $33^{\prime \prime}$ | 430 lbs . | \$0.22 | \$0.27 | \$0.32 | \$0.38 | \$0.43 | \$0.54 |
| $36^{\prime \prime}$ | 507 lbs . | \$0.26 | \$0.32 | \$0.38 | \$0.45 | \$0.51 | \$0.64 |
| $39^{\prime \prime}$ | 575 lbs . | \$0.29 | \$0.37 | \$0.44 | \$0.51 | \$0.58 | \$0.73 |
| $42^{\prime \prime}$ | 652 lbs . | \$0.33 | \$0.41 | \$0.49 | \$0.57 | \$0.65 | \$0.81 |
| $45^{\prime \prime}$ | 773 lbs. | \$0.39 | \$0.49 | \$0.58 | \$0.68 | \$0.77 | \$0.96 |
| $48^{\prime \prime}$ | 842 lbs . | \$0.42 | \$0.53 | \$0.63 | \$0.74 | \$0.84 | \$1.05 |
| $54^{\prime \prime}$ | 1000 lbs . | \$0.50 | \$0,63 | \$0.75 | \$0.88 | \$1.00 | \$1.25 |
| $60^{\prime \prime}$ | 1243 lbs . | \$0.62 | \$0.78 | \$0.94 | \$1:10 | \$1.25 | \$1.56 |
| $66^{\prime \prime}$ | 1514 lbs. | \$0.76 | \$0.95 | \$1.14 | \$1.33 | \$1.52 | \$1.90 |
| $72^{\prime \prime}$ | ( 1750 lbs . | \$0.88 | \$1.10 | \$1.31 | \$1.53 | \$1.75 | \$2.19 |

MATERIAL REQUIRED FOR LAYING PIPE

| SIZE. | SACKS OF CEMENT. |  |
| :---: | :---: | :---: |
| $12^{\prime \prime}$ | About 3 | sacks to 100 feet |
| $16^{\prime \prime}$ | About 4 | sacks to 100 feet |
| $18^{\prime \prime}$ | About 5 | sacks to 100 feet |



VIEW SHOWING SHIELDS AND JOINT


CROSS SECTION OF JOINT


DETAILS SHOWING MECHANICAL LOCK

WESTERN REINFORCED CONCRETE PIPE COMPANY Los Angeles, California

Western Roinforced Pipe Compary
Sirith and Utah Sbroets.
Ios Angolon, Dalifornia.

## Gentlemon: -

I am sonding by express profile oi line as per inatzuations of Colonel Flotaher. You vill noto thoro is about 15,500 ieot of this line winh will not exceed a 50-ioot hoad. Complete ipeoifications ion conerete line aro not available at this time but your reinforcing sustom mast be satisiactory and tho pipo dosigned to withstand tho required prossuro vith a factor of saiety of 5 .

A11 the pipe will io $18^{n}$ inside diameter and will bo laid in a ditoh $3-1 / 2$ feot in dopth, vinioh will be provided by the Company. The Company uill niso also distil bute the pipe. You vill backill suifioiently to protect the pipe and the company willoomplote the wak-iflling.

The line mast guarantead for one year. The leakage unker working oonaitions, not inoluding scopage, shall not be at a greater rate that 1 oubio loot por 24 hours for each 300 feot OX pipe.

I vas mabla to wize oost of aend and s?uahoa zook In San D10go and cannot get quotations until to-moxrom morninge I om under tho impression that jou can obtain sravel and probabl sand suificientiv oheaper in Los Angelas than in San Diego to justify alipping dom in darload lots. I mill vire quotations, justivy ohipping dom in ourlo
in Yours tauly,

THX: K

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Western Reinforced Concrete Pipe Co.,
Sixth & Utah Sts
Inos ingeles, California.
Gentiomen:-
Atrention Mr. Brier:
The 18" pipe line at Del Hor should be leid within fow or Iive months at the latest. sorry not to hare geen io prier todory. I
Youres very truly,
and the \(i\) ine is to be completed ready for uee Hey Flist, 1920.

Trusting that we may recoive your ordor for the worts, we rensun.
Sowna very truly.



DICT

Carbon Copy to Colonel BA. Flatcher.
-vistuant

\section*{}

LOCKUOINT SEWER AND WATER PIPE



ITp WHM Judy, Menager of Operation
08ty of San Diogo
Sen D1080. Cal 1 Pomie
Dear sirs
Re \(18^{\prime \prime}\) pipe sor San Dlegulto Itrtual Water Co
At the enggeation of the 8an Dlegalto Lutual Water Company we are giving you the zolloulng gpeozilcations of reinforce we are giving you the followng gpeos
ment for the 18 inch 11 at Del liar.

Por heade up to 25 feet, 093 American Steel \& Wire Company Triengiar wire meah. (.093 designates the effective area of steel per limeal foot of pipe and equale. 279 for the three foot secfion of pipe.

For heads trom 25 to 45 feet, 6 and \(1 / \mathrm{s}\) col1a \(5 / 16^{\prime \prime}\) round Bright Bessemer Steel wire in each three loot section of pipe.
For hoeds fram 45 to 60 20et, 7 and \(1 / 8\) colle \(5 / 16^{\prime \prime}\) round Bright Beapemer 8teel wire in each three foot seotion of pipe.
For heada 1 rom 50 to 60 foet, 8 and \(1 / 8\) cos s \(5 / 26^{\prime \prime}\) round Bright Bessemer Steel wire in each three foot section of pipe.

The wive co11s, 111 be spaced with three longitudinal, space bars in enoh oseo. Inight Bessomer Steel wire has \({ }^{2}\) an elaetio Iimit of 80,000 pormde per equare Inch. Me haye waed a working stres


Po are mable to obtain quarter inch bright Bessamer ateel and have thereione need Siv \(5 \sqrt{26}\) Inch in the sprogoing speciliostions.

Plpe folnte will be poured with a moxtarmixture of one part of Poiknand denent to one and a hals parteoos aand. The conorete inftrure in miting the pipe will be \(2: 2 \mathrm{~B}\).
rouri vary truig:
WESTHEM RE HIPORIASD CONORBUS PLPE COMPAKY


Win/
arson cony to col. Ed rietchar
宛。 momar Ho zine

Hfo IFIF Judy, Hemager of Operation
sity or San Diego
Sen Diego. Calisornia
Dear Sirs:

At the angseation of the san Dicgilto unturi vater Condiny we are giving Jou the rolloring ppecticatione ot reintive ment for the 18 inch line at Dal frar

 per ilneal foot of pipe and equale 279 for tho threo 500 l anc tion ox pipe.

For headd 2 rom 25 to 45 feet, 6 and \(2 / 5\) co11e \(5 / 26^{6}\) round Bifitit Bessemer steel witre in esch three 100 t neention of pipe.

For heads tron 45 to 50 teet, 7 and \(1 / 5\) eoile \(5 / 160^{n}\) sound Bright Bessemper 8teel wire in each three soot section of pipeo
 Bessemar Steel wire in each thriee foot taction er pipe.

 of 12,000 pomate in all Tofietcroment ppociestal abover
 heve therefose need it \(5 / 16\) tino in the forepoing tpearticuthou.

 Portzand Cemant to one and a halt parteoo

\section*{Tower:tary tratyo}



酸 3 有
Garton copy to col. yd Fiatchar
Carbom copy to col. yd Fletchar

Oolonel Ed. Fletaher
let oher Building
San Diego. Csilfornis
Dear \(81 \%\)
If we are awarded the contraot for the elghteen inch ine at Del Mar, we will of course use RiverAide Portland cement.
\[
\begin{aligned}
& \text { Yours very traly. } \\
& \text { WESTEREI RBINE CRCED CONOREIE PIPE COMPATY }
\end{aligned}
\]

\section*{lestern Reinforoed Concrete Plpe Co.} th \& Utah Sts.
Los Algozea. Calif.

\section*{Gentlemen:}

Enciosed herevith find a oheok from
the Cuyamsea Fater Company for \(\$ 1,000.00\), and oheck from Jas. A. Kmrey for \$4,000.00, making a total of the \(55,000.00\), due you as per agreement.

Yours very traly.

\section*{Mr. W. M. Brier. \\ 6 th \& 0 Reinforcod Concrete Pipe Co.: an}

Hy dear Lr. Brier:
Will jou please give us an estimate of the oost of constructing about 30 miles of conduit to carry 34 second feet of water, the same size gou to furnish pe line, we to dig the ditch and you to furnish cement, and all.

The grade is \(4-3 / 4 \mathrm{ft}\). to the mile.
will furnish you the the next time you are down portions of the the profile of the different portions of the flume under pressure that would have to be pat into a pipe.

We woald like the price per foot for a
or the price per foot for a pipe line i
conduit, or the price per foot for a pipe line in estimate fromait. present woon you for the cos present vooden ilume with a condrit the entire of the cost. One estimate you giving your estimate pipe, or conduit alone, and the other will be for the excavation and back filling.

Ir. Harritt will explain what we want
this information for and we are very anxious thet you should come down before the 10 th of January and look this matter over. Let Mr. Harritt know a day or wo ahead of the time when you are coming down.

Yours very truly.
EF:KTM

San Diego, Calif. Januar y 10, 1920

Cuyamaca Water Company, San Diego, Calif.

\section*{Gentlemen:}

You are authorized to turn the
water through the \(39^{\prime \prime}\) concrete pipe at the old Sweetwater trestle location on Konday, January 12th. If there are any leaks, we will come back and repair them.

Yours truly,
WESTERN REINFORCED CONCRETE PIPE CO


Western Reinforced Conerete Pipe CO., 6 th \& Utah Streets
Los Angeles, Calipornia.

\section*{Eentlemen:}

This is to notily you that the This is to notiry you that the
Sweetwater siphon is in bad condition, and
there are many leaks to be repaired, and
we request that you send an expert down here
immediately to put it in first cless condition, immediately to pat it in first cless condition,
according to conirict.

If you do not have a man down here by Hondsy, we will be compelled to fix it by honday, we will be compelled to fix it

\section*{Yours very truly,}

CUYAMACA WATER COMPAFY

By

Secretary

\title{
-WSutirn \\ Rmingonghd Coygrimpripegoyparys
}

\section*{REINFORCED CONCRETE PIPE FOR} SEWERS, STORM DENS, CULVERTS, IRRIGATION SYSTEMS

\section*{SIXTH AND UTAH STREETS}


February 10, 1922
3:00 P.M.

\title{
Ur. Tor. King \\ Engineer for Volcan Water Company \\ Fletcher Building \\ San Diego, California
}

Dear Sir: to be laid in an accesible location near San Diego, we quote approximate prices as follows:

Price per foot Hauling at Laying per foot at making ward \$2.00 per ton including material


The foregoing prices for laying do not include any excavating or backfilling.

The prices given are approximate and are based on an estimate of cost of reinforced concrete pipe made at Lakeside, in which estimate we used the following prices for materials. Cement \(\$ 3.71\) per barrel net (same as quoted to City of San Diego on Barrett Dame, Sand \(\$ 1.30\) per ton f.0.b. cars Lakeside, Rock \$2.15 per ton f.0.b. cars Lakeside. We have reduced the reinforcement from that estimated in this case. These material prices may not be the same for the project you have in mind but the prices quoted will. Give you a general idea. for comparing the different sizes. We shall be pleased to give you exact prices when you have the complete data.

Yours very truly,
WESTERN RE INFOROED CONCRETE PIPE COMPANY
Bx Mrmbriex
MATHER

\title{
Ed Fletcher Papers
}

\section*{Box: 33 Folder: 20}

\section*{General Correspondence - Western Reinforced Concrete Pipe Company}


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[^0]:    WESTERN REINFORCED CONORETE PIPE CO. Los Angeles, California

