THE COST OF LAYING PIPE

(Continued from page 174)

The cost of jointing having but one variable for any locality, that of wage, to find local cost per foot, it is only necessary to multiply the unit figure found in column C for cast iron pipe and column D for steel pipe, opposite the size of pipe to be laid, by the local wage scale for caulkers or joiners in cents per hour. As three kinds of labor are usually employed in jointing pipe, caulkers, yarners and leadmen, each of which may receive a slightly different wage, the wage of the caulkers only were used in calculating the unit figures shown in table, the discrepancy by this method being practically negligible for estimating purposes.

In jointing steel pipe the number of joints per manhour is considered to vary as the diameter of the pipe which takes into consideration the friction to be overcome in jointing pipes of different sizes as well as the weight of the pipe per foot of length.

Cost of Materials

The cost of pipe per foot used in tables is figured at \$1 per ton for cast iron and \$0.01 per foot for steel pipe, making it a simple problem to obtain local costs by multiplying by local prices.

Lead and yarn are figured at \$0.01 per pound each.

Fittings and specials are not included in charted costs, as conditions often make it necessary to handle this matter individually. For general estimating where extreme accuracy is not important, the unit cost per foot of pipe may be considered as including specials.

Store expense, which should cover the cost of maintaining a pipe storage yard or warehouse, unloading from cars, checking material, etc., has been estimated at 4 per cent. of the total cost of materials. This figure was obtained by checking the cost in several cities, and while it may not hold absolutely true in these days of abnormal prices, will not prove an error of great consequence where it is considered that at this time storage labor cost also has advanced above normal.

Drayage covers the cost of transporting materials from storage yard, warehouse or cars to the job and is based upon a cost of \$1 per tón-mile. Local drayage costs are obtained by multiplying the unit costs found in the tables under column E for steel pipe and column H. for cast iron pipe and opposite the size of pipe to be handled by the local cost per ton-mile in dollars.

Supervision, engineering and contingencies, which includes the time of the general foreman, watchman, waterboy, etc., the cost of preliminary surveys and estimates, running levels, lines, etc., as well as permits and overhead expenses or contingencies not otherwise classified, is estimated as 10 per cent. of the total cost of the job.

It is understood that a portion of the cost included in this classification usually is charged to operation, but must be included in valuation work where the entire cost of replacement is considered. Owing to the liability of unforeseen contingencies arising in any construction work it is good policy to use the entire ro per cent. in all estimates as a safety factor.

Appraisal engineers may find use for these tables and data in evaluating distribution systems as present day values may be obtained as readily as actual cost figures by substitution of the prices desired.

It was considered in all calculations that each class of work is carried on continuously, but that this is not a fact in usual practice does not affect the unit costs, as units of time, money and man power were used in obtaining the unit costs, which makes the cost per foot the same regardless of whether the operations are carried on for a fraction of an hour per day or continuously.

Cast Iron Bell and Spigot Pipe, A. G. I. Standard, 12-ft. Lengths

		L	aying Pipe.		al a la la la la
Size of pipe.	No. of men.	Weight of pipe per ft. in lbs.	Feet of pipe per man- hour.	Feet of pipe laid per hour.	Unit cost per foot at .01 per man-hr.
4	3	19.33	21.98	65.09	.000455
0	3	30.25	14.05	42.15	.000711
8	- 5	42.08	10.09	50.45	100000.
IO	5	55.91	7.60	38.00	.001316
12	7	73.83	5.75	40.25	.00173.
10	7	112.58	3.77	26.39	.002652
20	7	153.83	2.76	19.32	.003623
24	9	206.41	2.06	18.54	.004854
30	9	284.00	1.49	13.41	.006711

NOTE.—To find local costs per foot multiply unit cost per foot from table by the local wage scale per hour for pipemen. For water pipe, substitute weights of pipe for those given in the fourth column, and change the following columns proportionately.

		jounding Lipe.				
Size of pipe.	No. of men.	Weight of lead in lbs. per joint.	Weight of yarn in lbs. per joint.	Joints per hr. for gang.	Unit cost per ft. at .01 per man-hr.	
- 4	3	6	•37	0.25	000405	
6	3	9	.47	4.16	000601	
8	3	12	. 56	3.12	.000801	
IO	3	16	.65	2.34	.001068	
12	3	22	.75	1.70	001470	
16	3	36	1.06	1.03	002427	
20	5	50	I.34	1.25	.0022220	
24	. 5	62	1.60	1.04	.003333	
30	5	75	2.00	.83	.005020	

NOTE.—To find local costs per foot multiply unit cost per foot from table by the local wage scale per hour for caulkers.

Trenching and Backfilling.

Size of	Width of trench	—Cu. ft.	per ft.—	Cost of trenching and back- filling at .or per man-hr.	
pipe.	—in.	Trench.	Bellholes.	Trench.	Bellholes.
4	20	1.66	.405	.00184	.00045
6	22	1.83	.459	.00203	.00051
8	24	2.00	.513	.00222	.00057
IO	26	2.16	.540	.00230	.00060
12	30	2.50	.594	.00277	.00066
10	36	3.00	.702	.00333	.00078
20	40 '	3.33	.783	.00360	.00087
24	44.	3.66	.864	.00406	.00006
30	50	4.16	1.000	.00461	.00111

NOTE.—To find local cost per foot multiply unit cost per foot for trench from table by the depth of the trench in feet; then add the unit cost for bellholes from table and multiply by the local labor wage scale per hour. Formula:

[(Unit cost trench) (depth of trench in feet) + (unit cost bellhole)] × (Hourly wage scale in cents).

Summary of Unit Costs.

Size of	Trenching a	Labor_ nd backfilling		
pipe. Inches.	Trench. A	Belholes.	Laying. C	Jointing.
4 6 8 10 12 16 20 24	.00184 .00203 .00222 .00230 .00277 .00333 .00360 .00406	.00045 .00051 .00057 .00060 .00066 .00078 .00087	.000455 .000711 .000901 .001316 .001739 .002652 .003623	.000405 .000601 .000801 .001068 .001470 .002427 .003333
30	.00461	.00111	.006711	.004000