Engineering	.....	14.66
	$1,632.09	$5,117.61

The total cost was $6,749.70.

I consider that ordinary conditions do not require the necessity of paving for the pit, but good drainage is essential in most cases.

For power we are using electricity and compressed air, while some of the 80 and 85-ft. tables are being turned by hand. Air motor in use at Jamestown, N.D., cost at St. Paul, $450; installation $19.81; total, $469.81. Electric tractor furnished by Nichols and Brother, cost $1,104.37; installation, $115.86; total, $1,220.23.

W. T. Powell, Colorado & Southern Ry.—The up-to-date table should be 80-ft. long, with a capacity for turning 200-ton engines. We installed recently an 80-ft. 200-ton through-plate girder table which cost as follows:—

Table f.o.b., Denver, including circle rails.....	$3,700.00
Material for concrete foundations and walls.....	1,090.00
Labor	1,600.00
Total cost	$6,390.00

This table replaced a 66-ft. table and we were compelled to excavate and put in the curbing under 42 tracks and keep them safe while in use. We drove 24 piles for centre foundation and capped it with a block of concrete 12 ft. square and 4 ft. thick; a deck table of this length and capacity would cost about $600 less. We use concrete entirely for masonry; rails are fastened with bolts and cast clips, the bolts being set in the concrete; no paving; drained when necessary. We use air power with a two cylinder motor.

J. S. Browne, New York, New Haven & Hartford R. R.—We have recently installed an 80-ft. table at Providence. The centre pier is of concrete, reinforced with steel rails, on account of the irregularity of the supporting material, as it was feared that the concrete might be fractured by the load if laid without re-enforcement. The outer wall of the pit and the paving are also of concrete.

While an accurate record was not kept of the cost it was approximately as follows:—

80-foot steel table delivered at Providence.....	$3,400.00
Placing coping and circular rail and moving table into pit	800.00
Concrete in outer wall and centre, including forms	2,800.00
Excavation, including disposal of material.....	1,500.00
Paving	300.00
Drain pipe to connect with sewer.....	200.00
Total	$9,000.00

The work was done by the company's force, and the high cost of excavation was due to the fact that a portion of the work was done in freezing weather, and it was necessary to handle the material more than once before its final disposal by work trains.

The company's standard main line turntable is 75-ft. long, but 80 ft. is considered better at points where the largest type engines are turned, to permit of properly balancing them. Deck plate girder tables are used where sufficient depth is available without excessive cost, but where this is not feasible, half through plate girder tables are used. The superstructure of deck tables is about 30 per cent. cheaper than that of half through tables, but this saving is balanced by the greater cost of the pit, so that under ordinary conditions the total cost of these two types is about equal. Gasoline motors are generally used for power, although electric motors may be used to considerable extent in the future.

CURRENT CONSUMPTION.*

By R. S. Pilcher (General Manager, Corporation Tramways, Aberdeen).

Everyone connected with the management of electric railways in these days realizes the importance of the subject of current consumption, whether the railway department has its own power station or not. The cost of electricity to any railway system may be the question of a profit or loss on the year's working. In Aberdeen the cost of current averages at 22 cents per unit, and the units consumed work out at 250 per car mile, making a cost of 26 cents per mile run. The proportion of this to our working expenses is 23 per cent., or more than half the cost of all our wages paid. I notice that in some of the largest towns in the country, the power expenses are about 30 per cent. of their total working expenses, and in one town they are as high as 35 per cent. I think you will agree with me that no effort should be spared in trying to prevent the systematic increases in current consumption which are to be seen all over the kingdom.

It is a fact, I believe, that the records of most towns in the United Kingdom and Ireland show an increase year by year in the consumption of current per car mile, and this is chiefly owing to track and car equipments becoming older, as well as to the great increase there has been in recent years in the number of top covered cars in use. I believe the increase through top covers is due in a small degree to the extra weight and windage of the covers, but in a larger degree to the extra carrying capacity of the cars in wet weather, and, in consequence, the greater number of stops which the cars have to make in a given time.

I have heard some railway officials speaking on this subject, who think that there is a great deal of current wasted through defective motor fields, badly worn pinions and gears, bent axles, etc., and I believe that in systems which have only been running a few years, much of the increased consumption may be due to this. But most of our systems have now been running over five years, and have replaced pinions, started to replace gears and field coils, in this way continually renewing the car equipments, so that I am inclined to think that the bringing forward of these causes of increased current consumption is rather apt to blind us to the true remedy, which, in my opinion, is to be found in the correct method of driving. We, in Aberdeen, could not afford to scrap any more field coils, and we get the full life from gears and pinions, but, we can afford to give a great deal of attention to the motormen.

Five years ago I experimented on one of the English railway systems with a view to saving current, and by instructing the motormen in the series parallel system of controlling motors, and by showing how it was possible to save current without decreasing the speed of cars, a reduction of over 7 per cent. was made.

In Aberdeen I started a similar system three years ago, which has also been very successful. In the first place, each motorman is brought into the office, and before a blackboard thoroughly instructed in the series parallel system of control by means of diagrams. I spent a great deal of time in illustrating the difference between two motors running in series and two motors running in parallel, also how it is that when motors are in series they only have half pressure, half speed and half the consumption of current. I find that it has to be

* Paper read at Eighth Annual Conference of Municipal Tramways Association.