

more than doubled (from about \$23,000,000 which it is at present).

The reduction in annual fire losses due to track elevation is difficult to compute. Be it said, however, that the delay to the fire department in reaching conflagrations is enormous when the railroad crossing gates are closed for passenger or freight trains. Every moment elapsing between the time a fire starts and the arrival of the fire department at the site is vital and is a matter of important consideration when viewing the delay due to a blockade at one or more railroad crossings.

Some additional benefits due to track elevation, obviously only a brief survey of the situation, are here enumerated:—

1. New districts are opened for settlement, thus reducing local congestion in population.
2. Accessibility to churches, markets and schools is improved.
3. Courts have fewer cases due to trespass, "hitching," or car thieving, etc.
4. Few streets are now crossed by railroad yards. Twenty-one yards have been elevated to date.
5. Better time is made by trains; fewer accidents occur for which the public has to suffer and for which the railroads have to pay; railroad rights of way are more clearly defined; freight trains do not have to be cut at street intersections.
6. Underground pipes and conduits are more accessible in subways than when lying directly under the tracks where the latter have not been elevated. Breakages of pipes and conduits due to the impact of heavy track loads are eliminated.
7. Improvements, such as new station buildings, new team yards, new freight houses, etc., are secured. In fact, within the limits of track elevation, the railroads are entirely rebuilt and reconstructed along strictly modern lines.
8. Future electrification of the railroads is made easier in that the third rail and return circuits can be more easily disposed of. This, however, is only one of the many difficulties attending the consideration of the question of electrification.
9. Nine unsightly viaducts have been removed. An additional viaduct will be removed this year. Only three away from the river will remain after this year.
10. Seven railroad grade crossings have been separated. One more has been temporarily separated. Three additional cases will be disposed of under existing ordinances with the probability that two more will be agreed upon by the rail-

roads before all the ordinances now in effect have been executed.

Track elevation results have been tabulated above. The benefits have just been outlined. Let us see how much has been drawn from the City Treasury to help pay for this \$72,622,000 improvement that the railroads have made.

The diversity of design as to retaining walls and abutments, both for foundation and masonry above foundations, is almost as great as in the superstructures. In the early years of track elevation the use of cut stone and rubble masonry was general, but to-day concrete is used exclusively. During the last five years walls and abutments have been constructed of reinforced concrete by some of the roads.

The soil in and about Chicago is not the best for foundations. Few of the roads place the bottom of foundation more than one foot below the frost line. Two companies use caissons for column foundations. Of those companies constructing foundations only a trifle below frost line some drive piling under the toes of the retaining walls and abutments. Others extend the toe to add greater resistance to overturning. The soil is soft and some settlement results except in the case where caissons are sunk to bed rock. Concrete walls above foundation are constructed with "battered" or "stepped" back, according to preference of the engineers.

An earnest effort is being made to prevent the percolation of water through the walls and abutments. This improves the appearance and lengthens the life of the concrete. Some roads coat the back with asphalt or pitch. Some employ longitudinal drainage either four or five feet below the elevated track level or at the original grade of the tracks. Some use "weep" holes through the walls.

The writer will not attempt to go into discussion of the methods pursued by the different companies in elevating their tracks, unit costs, etc. Such a subject is interesting but would probably be out of place in this brief discussion. Suffice it to say, that, whereas, in the early years practically all work was done by hand, to-day nearly all classes of heavy work are performed by machinery. By the latter method smaller forces can be employed eliminating delays and uncertainty due to labor troubles. The rate of progress is thereby accelerated and a more uniform daily output assured. Even with the use of machinery track elevation gives employment to about five thousand men annually in Chicago.

Taken as a whole, Chicago track elevation as it appears to-day is a most satisfactory public improvement. There are a few places where reconstruction will be necessary in the

TABLE No. 2.

COST OF TRACK ELEVATION TO THE CITY OF CHICAGO.

Note—Percentages shown are on basis of cost to the Railroads (\$72,662,000.)

Department Expenses to date	\$	\$ 66,084.29	\$	0.09 %
Damages paid to date:				
At 10 Streets where Viaducts were removed	256,151.01			
At 709 " " no " existed	105,107.75	361,258.76		0.50 %
Total paid out of City Treasury to date		\$ 427,343.05		0.59 %
Paid into City Treasury Account Track Elevation		280,000.00		0.39 %
Net Cost to City to date			147,343.05	0.20 %
Estimated Damages yet to be paid on account Track Elevation Ordinances to date		350,000.00		0.48 %
Plus above		361,258.76		
Total estimated to be paid out of City Treasury for damages account Track Elevation Ordinances to date		\$ 711,258.76		0.98 %
Plus above		66,084.29		
Total estimated to be paid out of City Treasury including Department Expenses Account Track Elevation Ordinances to date		\$ 777,343.05		1.07 %
Less above		280,000.00		
Net estimated cost to City Account Track Elevation Ordinances to date			497,343.05	0.68 %