pavement. The sheet pavements have reached this popularity for residential streets due largely to their comparative dustlessness and lack of noise.

The standard width of pavement adopted in Toronto for a main thoroughfare, 86-ft. wide, where tracks are laid, is 54-ft. from kerb to kerb, allowing 18-ft. of pavement on either side of the track allowance, or 19′ 3″ if we include the blocks next the rails. This width provides for two lines of traffic. Where the street is only 66′ wide and tracks exist, the standard is 42-ft., giving a pavement 13′ 3″ on either side of the track allowance, including the blocks next to the rails. On residential streets, the standard width of pavement is 24-ft., although in the past some pavements as narrow as 18-ft. have been constructed. Pavements of greater width than 24-ft. are laid where traffic conditions warrant it. There is now an agitation to have the standard width for residential streets increased to 28-ft. The agitation for this increased width is due to the increase in motor vehicles and the desire of their drivers to be able to pass slow moving vehicles with less inconvenience.

I am of opinion that such a provision is good in so far as the more important thoroughfares are concerned, but it is a hardship to force people to pay for a pavement of greater width than is needed for the traffic of the street, and it will also increase the cost of maintenance materially.

The crown of pavements in a city is also a very important question, and while a high crown tends to increase the life of a pavement by causing the surface water to run quickly to the gutters, it is very hard on horses in frosty weather and in summer time when flushing is being resorted to. This difficulty has become so great during the past year or two that we are now reducing the crown of all new pavements very materially. A few years ago the standard crown for a 24-ft. asphalt pavement was 6″. In 1911 this was reduced to 5″ and a further reduction to 4″ is now contemplated.

Drainage troubles in the construction of city pavements are not very serious, for, as a general rule, the streets are provided with the necessary storm sewers for taking care of the surface water. Catch basins are constructed on opposite sides of the street about every 300-ft., with large openings so that the surface water may quickly reach the sewers. These openings are provided with suitable grates to prevent larger solids from entering the catch basin, and a trap is usually provided to prevent the escape of sewer gas, and also to keep floating rubbish from entering the sewer. In order that the catch basins may be kept clean they are provided with a semi-circular bottom which enables the long scoop to be effectually handled. The main difficulty in connection with surface drainage that has to be contended with in Toronto is getting rid of the water on some of the east and west streets where the grade is practically level. This is usually accomplished by what is termed false grading, that is, the face of the kerb is increased at the catch basin, and decreased at a point some distance away. In this manner five to three inches of additional fall may be secured, which will effectually carry away the water.

One of the most important features of pavement work as carried on by a municipality, is inspection, and as a general thing, great attention is given to both inspection of materials and supervision of the work, to see that the provisions of the specifications are being carried out.

The city of Toronto is provided with a good testing laboratory, in charge of a capable chemist, in which all materials are carefully inspected. Every carload of cement used on city contracts must pass the ordinary seven day test, before used on the work, and if any doubt is aroused as to its soundness, it is held for twenty-eight days. All asphalt, asphaltic mixtures, fluxes, etc., are investigated in the same way, so that the city is reasonably sure of good work, notwithstanding the five year guarantee exacted.

The sand and stone that are used in the manufacture of a pavement must also have careful consideration, and to this end numerous sand and stone gradings have to be made each year to verify the standards laid down in the specification.

The organization in force to look after the actual construction work is as follows: A district superintendent in charge of all contract work in a given district, and under his care sufficient inspectors and time-keepers to take care of every branch of the work. The city also does a good deal of work by day labor.

Probably the feature that gives rise to the greatest amount of controversy between the Engineering Department and the property owners is the question of grade, and the greatest care has to be exercised at all times to see that the grade established on any street does not give rise to claims for damages. Apparently it does not matter whether you cut or fill, the claims for damages appear just the same. Little or no difficulty is experienced in the older parts of the city, but when we start to work on some of the newly annexed portions of the city we are met by conditions that are hard to overcome; buildings have been erected without regard to probable street levels, and as a result the grade has to be mutilated in order to provide proper access to the property.

To overcome this trouble in the future, the department now gives building grades to intending builders and any new streets accepted by the city are only accepted on condition that no claims for damages will be made by reason of the grade established for the roadway.

Instances have occurred in certain parts of the city, where 12 per cent. grades have been established because the cutting or filling necessary would have practically destroyed the adjacent property.

The costs of the various pavements are as follows:—

2″ asphalt, 1″ binder, 6″ concrete	$2.25
2″ asphalt, 1″ binder, 5″ concrete	2.00
2″ asphalt, 4″ concrete	1.60
2″ asphalt, 1″ binder (surface only)	1.05
3″ asphalt block, 4″ concrete	3.45
2″ bitulithic, 4″ concrete	2.15
2″ bitulithic, 5″ concrete	2.30
2″ bitulithic (surface only)	1.75
Brick on 4″ concrete (Canadian)	2.55
Brick on 4″ concrete (American)	2.75
Brick on 6″ concrete (Canadian)	3.00
Brick on 6″ concrete (American)	3.20
Wooden block on 6″ concrete	...

The concrete foundation work is composed of:—1 cement; 3 sand; 7 stone.

By instruction from council the Works Commissioner has to submit a tender for all work advertised, with the exception of large bridges and buildings for which special plant is required. As a result the department does a good deal of work by day labor.

In order to carry out this work economically and efficiently, adequate plant and superintendence is necessary. Last year council sanctioned the purchase of a great deal of plant for sewer and roadway construction, which will place the department in good shape to undertake any work of this character that it may be called upon to do. In addition to good plant a force of efficient foremen and superintendents is necessary, and I am glad to say that the city is as well provided with good men to fill these positions as any similar organization anywhere. The day labor work is carried on as a separate branch of the roadway section, with its own superintendents and timekeepers.

The maintenance of city pavements is probably the most important feature, and at the same time the most difficult to properly carry out, but after a good deal of experiment a