

In connection with the manufacture of bitumen from semi-asphaltic petroleum, such as are found in Texas and southern Illinois, it is desirable to know that usually the blowing process, as well as the distillation process has to be used, although subjecting the oil to a special preliminary cracking process may make blowing unnecessary. Blown asphalts have a much higher melting-point for a given penetration and a much lower ductility and lower specific gravity.

For the purpose of fluxing solid or semi-solid bitumens in England tar is very often used, but I would not recommend the use of tar in this country. Liquid asphalts should be used.

COSTS.

While costs of various pavements abroad are not of very much use in this country, the following information may be of some interest. Generally speaking the cost of pavement-construction is heavier in England than in America, although wages are considerably less.

In Los Angeles the average costs of city pavements at present rates of exchange are as follows:—

	Per Square Yard. s. d.
Asphalt pavement—	
5 in. concrete base, paint binder 1½ in. surface	10 6
5 in. concrete base, 1 in. asphalt-concrete binder, 2 in. surface	10 11
6 in. concrete base, 1 in. binder, 2 in. surface	12 2
3½ in. bituminous base, 1½ in. surface	7 11
5 in. bituminous base, 1½ in. surface	9 8
Warrenite-Bitulithic—	
3½ in. bituminous base, 1½ in. surface	8 10
5 in. bituminous base, 1½ in. surface	10 6
5 in. concrete base, paint binder 1½ in. surface	10 11
6 in. concrete base, paint binder 2 in. surface	12 7
Topeka pavement, 5 in. concrete base, paint binder 2 in. surface	10 6
Concrete pavement, 5 in. thick	9 8
Concrete pavement, 6 in. thick	10 8
Concrete pavement, 7 in. thick	11 9

The following shows some very recent typical London prices:—

	Per Square Yard. s. d.	s. d.
Asphalt pavement, 5 in. thick	17 6	21 0
Asphalt pavement, 2 in. thick with two years' maintenance	12 0	15 0
Wood block on 9 in. concrete foundation	38	3
Rock asphalt, 1½ in. thick, with one year's maintenance	12	0
Wood block on 12 in. concrete base	54	2
12 in. concrete foundation only	30	0
4 in. tar-slag macadam	8	2
2 in. asphalt carpet	10	5
Rubber pavement	80	0
Tar-spraying and gritting	0 4	0 5

The Chester City Council has carried out work recently for the following prices:—

	Per Square Yard. s. d.
Granite sets on 7 in. reinforced-concrete foundation	32 6
2 in. rock asphalt on 7 in. reinforced-concrete foundation	21 0
4 in. wood block on 7 in. reinforced-concrete foundation	28 10
5 in. wood block on 7 in. reinforced-concrete foundation	31 10
2 coat bituminous macadam	16 3
4 in. penetration pavement	11 0
7 in. reinforced-concrete tar-sprayed	16 6

Recording Costs.—Elaborate costing systems are a feature of a number of American jobs. It would be impossible to get the average New Zealand foreman or overseer to carry them out satisfactorily. They usually seem to be operated in the United States by university graduates in engineering, who, to gain experience on works, take up subordinate positions as timekeepers, &c. There always seems to be an ample supply of such men for reasonably large jobs.

In New Zealand there is a very great field for improvement in recording costs, but accuracy and up-to-dateness should never be sacrificed for detail. In general it may be said that engineering costs cannot be entirely entrusted to a book-keeper or accountant; the value of the record consists in the data being reduced to units that will be immediately applicable to future work in the statement of the conditions governing the data, and in the logical arrangement and clearness of tabulation employed.

PLANT.

With the great increase in road-development and the big changes in type of construction during the past ten years there has been considerable activity in the design and manufacture of new plant, particularly in America.

Motor-trucks and Steam-wagons.—Where haulage of road-materials over good surfaces is required the heavy motor-truck or steam-wagon is most efficient. Unfortunately we have in New Zealand very few roads capable of withstanding such heavy traffic except in the driest of weather, and comparatively light trucks on pneumatic tires would appear to be the most suitable for construction