Sheet asphalt will sustain a very heavy traffic. This statement applies more especially to a traffic largely composed of quick moving, light to medium loaded vehicles, such, for instance, as prevails on Fifth Avenue, New York. It is not the most suitable type of pavement for a very dense, slow moving, heavily loaded iron tired traffic. Wood block and granite block will outlast it under these conditions. It will not give satisfaction where there is practically a total absence of traffic, as it then is liable to develop cracks, apparently requiring the kneading action of traffic to equalize the stresses set up by contraction and expansion and to keep it in proper condition. It is entirely suitable, however, for traffic varying from the light delivery traffic of residence streets to the dense but quick-moving traffic of Fifth Avenue, New York, or the Thames Embankment, London.

Sheet Asphalt Pavement

Generally speaking, the heavier the traffic, especially iron tired traffic, the finer should be the mineral aggregate used, owing to the fact that the coarse particles are more liable to fracture than the smaller particles. Where fracture takes place to any considerable extent, rapid deterioration of the pavement will ensue, as the bituminous cement ordinarily used is not sufficiently fluid at atmospheric temperatures to rebond and re-coat the fractured particles, and these will quickly be pulverized and washed out, leaving depressions where water will accumulate and eventually rot the pavement. Where the traffic, *even though heavy*, is largely or wholly composed of rubber tired vehicles, a greater proportion of coarse particles is permissible and desirable. In proper proportions they add greatly to the stability of the pavement and under the conditions stated the light traffic mixture given in the table would be entirely suitable if the bitumen were increased to say, 11%.

The standard sheet asphalt construction of the present day is one and one half inches of binder and one and one half inches of wearing surface. The binder should be of the "close" type; i.e., should contain approximately 20% of material passing an 8-mesh sieve, and approximately 15% each of ¼-inch and ½-inch stone.

A close binder properly made and laid will be superior in many respects to the mixtures which have been laid on a large number of country highways and will carry a fair amount of traffic for a considerable time without suffering any serious damage. Poor binder will break up very easily—sometimes it can be kicked up—and the hauling of the hot surface mixture over it will damage it very seriously. Surface mixture laid on a binder of this kind which has been badly broken up might almost as well be laid on loose broken stone and will not give satisfactory service under heavy traffic. The binder should, of course, be thoroughly compressed with a steam roller before laying the wearing surface on it. Lack of compression will produce an unsatisfactory foundation for the wearing surface, and binder which is too cold or made with too hard an asphalt cement or an insufficient quantity of asphalt cement can not be properly compressed into a dense, tough mass. In hauling the binder to the street over long distances or in very cold weather, it may become chilled below the danger point. During the hauling process a certain amount of surplus asphalt cement usually drains off of the stone and accumulates on the bottom of the cart or wagon. If these excessively rich portions be laid on the street, what are called rich or fat spots in the binder course will be produced. As the name implies, these are places carrying an excess of asphalt cement. If these are permitted to remain, the surplus asphalt cement will be absorbed by the hot surface mixture when it is placed over them. This will make a soft spot in the finished pavement which will be displaced by traffic and eventually produce a hole or depression in the pavement. They should, therefore, be cut out and replaced with normal binder.

Before laying the surface mixture on the finished binder course the latter should be dry and swept clean of dirt; otherwise the layer of wearing surface will not adhere properly to it. Binder should be covered with surface mixture as soon as practicable after laying it. In many large cities it is required that all binder laid should be covered the same day with surface mixture.

Extreme care should be taken to insure a proper union between the surface laid on successive days. The first loads laid in the morning at the point of termination of the previous day's work should be a little hotter than normal so that the hot mixture may soften the cold edge of the pavement and bound perfectly to it. The joint should be bevelled and freshly cut away unless the rope joint or a similar method is employed.

The practice of painting the edge of the joint with hot asphalt cement is not to be recommended, as unless extreme care is exercised, too much asphalt cement will be used and that portion of the pavement will be too rich in bitumen and consequently softer than the rest, which will result in uneven wear and possibly shoving. Great care should be taken not to leave any hump or depression where the joint is made.

Topeka Pavements

Topeka mixture pavements are laid from two to three inches thick and are frequently placed directly on the foundation. Much better results are obtained by using a binder course one and one-half inches thick next to the foundation with a one and one-half or two inch wearing surface. This greatly reduces the tendency of the finished pavement to shove. With a well graded mixture a squeegee coat is unnecessary although it is frequently employed.

The mineral aggregate as fed to the drier consists of a mixture of broken stone and sand which is liable to segregate in the bin. The hot aggregate should, therefore, be screened and separated into two sizes and kept in separate bins. Definite amounts of coarse and fine material should be weighed into each batch. Unless these precautions are observed, portions of the pavement will have an excess of coarse material and vice versa and the normal bitumen contents for an average mixture will be too rich for the coarse portion and too lean for the fine portion.

The bitumen content of these mixtures is somewhat lower than for sheet asphalt and must be very closely watched and kept within much closer limits than are necessary with sheet asphalt mixtures. One-half per cent. above or below normal is about the permissible variation. Too little bitumen will make a pavement which is too open and porous and too much bitumen will render the pavement very liable to shoving.

The general methods of manufacturing and laying and the precautions to be observed are substantially the same as for sheet asphalt. The surface of pavements of this type is somewhat rougher than sheet asphalt, hence they can be laid on somewhat steeper grades. They will normally carry a somewhat heavier iron tired traffic than the coarser bituminous concrete mixtures but not as heavy a traffic as sheet asphalt. Unless laid under very rigid and competent inspection, it is far safer to use sheet asphalt.

Bituminous Concrete

Bituminous concrete pavements, as previously noted, have a mineral aggregate consisting wholly or largely of stone of varying sizes from 1½ inches down. Some of them are made of run of the crusher stone and some of them (Bitulithic, etc.) are made of carefully graded aggregates. Where the aggregates are graded it is customary to separate the different sized particles in from three to five bins and weigh out definite amounts from each bin for every batch. The normal bitumen content is lower than in Topeka mixture. An excess of bitumen will affect them in much the same way as a Topeka but to a smaller extent. From two to three inches of the surface mixture are usually laid directly on the foundation. It is very difficult to completely close up such a mixture by rolling. It is usually therefore given a squeegee coat of hot bituminous cement after which stone chips are spread over the surface and rolled in, the excess being left to be ground away by traffic. In some cases a thin layer of what is substantially a sheet asphalt surface mixture is used as a seal coat and if this practice

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