

TECHNICAL INFORMATION

Surface Types

Terminology

In order to understand modern pavement design and construction, it is necessary to have an appreciation of the various terms used. The structural layers comprise, sub grade, capping layer, sub base, road base, base course and wearing course. The functions of each of the layers are as follows.

The **sub grade** is the natural soil or made up ground (fill) on which the pavement is built. On re-constructed roads it is usually well compacted by traffic, on new roads it is carefully shaped and compacted to the appropriate level and profile. The surface of the sub grade is known as the formation.

A **capping layer** is sometimes laid over a weak sub grade to act as a sub grade improvement layer. This is usually a relatively low quality, cheap, locally available aggregate. With some soils, sub grade improvement can be achieved by treating the surface with lime or cement. In either case the aim is to ensure adequate support for plant used to lay the sub-base.

The **Sub Base** is the main foundation layer and its principal function is to act as a platform upon which pavement construction can take place without damage to the sub grade. It also acts as a final loading-distributing layer and provides a depth of frost resistant material.

The sub grade and the sub base together are known as the foundation.

The **Road base** is the main structural layer which provides the major part of the strength and load distributing properties of the pavement. It must resist permanent deformation and fatigue cracking from repeated loadings.

The **surfacing** normally comprises two layers - a base course and wearing course. Although in very light traffic conditions where the increased contribution of evenness of the final surface made by a two layer surfacing is not considered necessary, the surfacing might simply comprise a single layer. The base course layer distributes some of the traffic loading and also regulates the underlying layer to provide an even profile on which to lay the relatively thin wearing course layer. The wearing course provides not only the initial load distribution but also a weather proof finish to the construction that gives skid resistance and resistance to polishing and abrasion by traffic and even running surface and one that will rapidly shed surface water.

Bituminous Surfacing Materials

There are several types of bituminous materials that can be used for roads, driveways, footpaths etc. Each has its own specific quality for the use it is intended for e.g. Drainage,

wearing and or traction purposes among others. SM Morris survey each job and decide on the ideal material required. This survey process will be explained to you by a member of our staff at the time of the survey.

Basecourse Mixes

These materials are used to give a good firm surface on which to lay a wearing course material. They consist of a well graded large stone and dust mix which gives a good matrix. Held together by bitumen, this gives a well bound, dense material which is suitable for laying the wearing course on. It is essential for all asphalt wearing courses to have a base course macadam because of the density of asphalt that provides ultimate endurance against wearing. This eliminates the risk of fragmentation which may occur when you do not lay the correct base course.

It is not essential for all tarmac wearing course mixes, where a good stone foundation can also provide the base course required on certain jobs. For example: household driveways, private roadways, play areas, tennis courts etc. This can be further explained at time of survey.

Coloured Macadam

Until recently, there was a very limited range of colours of pigmented asphalts and macadam available, with red being the predominant colour but recent development of special binders now permits a wider range of colours, the most popular being red, green and beige.

Wearing Course Mixes – asphalt

Specification for hot rolled asphalt: This material consists of a high sand content along with a specific amount of stone held together with enough bitumen to give a well bound mix. Asphalt is a very strong material and is also extremely durable. It is used mainly on very high traffic areas where the addition of chippings can be used to give good skid resistance. For example: Shopping centre car parks where there is a lot of twisting and turning and heavy load delivery vehicles, main motorways, airport runways etc. Designed for commercial use, not suitable where a neat finish is required.

Stone Mastic Asphalt. A very durable mix which is also stable and resistant to deformation. Very high stone content provides reduced noise levels. Surface water is also reduced due to the very high void content which can be extremely useful on level areas. The mix is strengthened by the addition of dust and a very high bitumen content held in the mix by the use of fibres. A very popular material which has been used in America for over 20 years and is becoming increasingly popular in Ireland and the U.K. Ideally suited for driveways.

Additional information: It would be virtually impossible for us to list on paper all the types of tarmac and asphalt surfaces, there is endless variations of materials and mixes available. The most important thing is that you understand the basics and we hope we have provided you with a little insight to the requirements. Remember the actual material

and the way it is laid are the most important factors when it comes to providing the perfect surface that you demand.

Wearing Course Mixes – Macadams

There are three main wearing course material, 6mm, 10mm and 14mm and all are used for specific jobs. Each mix can be individually tailored to your specific requirements, for example, where extra drainage is required an open texture can be specified which increases the amount of stone used in the mix. This will slightly reduce the durability of the surface but under some extremes may be necessary. The opposite of open texture would be dense texture where the specification would be to add in more fines, such as sand, stone dust etc. This creates a smoother more durable wearing surface than normal. Good all round drainage is essential in order to use this mix because it eliminates any water seepage.

Specification for 6mm wearing course.

This is a very fine mix which gives an excellent finish but does not have the strength required for heavy traffic and is therefore used mainly for footpaths, play areas and small household driveways etc.

Specification for 10mm and 14mm wearing course.

These mixes are the preferred mixes for heavy traffic areas with each material providing an excellent finish coat and both having the strength and durability to resist wear by heavy traffic. 10mm is a particularly good finishing material when extra fines and bitumen are added. We will determine the right mix on survey after we have ascertained the amount of traffic in the required area.