

Highway Maintenance Treatments

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| The purpose of the carriageway construction is to spread the load of the traffic travelling across its surface. The type of maintenance treatment depends upon which layers of construction have failed and what type of failure has occurred. This determines the type of treatment required. |  Surface |  Surface Course | Provides skid resistance, ride quality and waterproofing of lower layers. |
| | |  Binder Course | Provides minor structural contribution |
| |  Base |  Base | Main structural layer, spreading the load and stress over the foundation |
| |  Foundation |  Sub Base | Second structural layer. Insulates the subgrade from frost |
| |  Subgrade | Underlying ground | |

Types of Treatment

There are two main categories of work with many treatments in each:

1. **Structural Maintenance** is more extensive work carried out on roads and footways in the worst condition. This is the most expensive and disruptive type of maintenance that involves taking up and relaying surfaces to varying depths depending on the severity of deterioration.
Treatments include - Reconstruction, resurfacing, overlay, recycling.
2. **Preventative Maintenance** is just as important for managing the road condition. It is carried out on roads and footways that are beginning to deteriorate or have minor defects. These treatments prolong the life of roads and footways, restore skid resistance, aid waterproofing and arrest their progression to needing structural maintenance.
Treatments include - Surface dressing, micro-asphalt, footway surface treatments.

Treatment Selection for Planned Highway Maintenance Programme

Various inspections are undertaken annually, to determine the road condition and produce a prioritised programme of planned work. The treatment selected for a particular road is dependent upon its condition.

Surfacing – The depth of any surfacing work is dependent upon the type of defects and which layer of construction they occur in. If the road is showing signs of wear and tear the carriageway can be overlaid. If defects such as potholes are confined to the surface it can be resurfaced (50mm). If potholes are deep and the road has lost its shape it may need reconstructing (100mm+).

Recycling – is undertaken when the foundation of the road is good but the top layers are beginning to break up and the road has lost its shape. The new surface seals the road and prevents water getting in which prolongs its life.

Surface Dressing – is undertaken during the summer months on roads that are beginning to show deterioration i.e. minor cracks in the surface appearing and potholes developing.

Micro-Asphalt - is undertaken on roads showing the first signs of wear and tear. Only the very top surface needs treating to make it water-tight and help prevent further deterioration. The treatment increases skid resistance which improves road safety and seals the road surface which extends its life, making the treatment particularly cost-effective.

Footway Slurry Seal – is undertaken on footways showing the first signs of wear and tear. It is a low cost treatment that can extend the footway life up to 10 years and costs just a tenth of the price of resurfacing.

Structural Maintenance Treatment Processes



Reconstruction - This is the most expensive type of treatment and usually involves replacing the surface course, binder course and base with new materials.

Resurface – The existing surface is removed and the surface course is replaced. This can also include the binder course.

Overlay – The new surface course is simply laid over the top of existing surface, but this treatment is dependent upon the ability to raise the edges of the road.



Recycling - The road is broken up and new bitumen is added, these are then mixed together and the material can be reshaped and rolled to create a solid structural layer. The surface is then sealed with a surface dressing. It is also known as 'Retread' - Shallow In-Situ Recycling because it only goes down 75mm (3") and 'in-situ' because the material is recycled on site.



Refurbishment – Typically this includes all elements (kerb, footway and carriageway) being treated to varying degrees. The kerbs may require isolated repairs or the full length will either be relayed or replaced with new kerbs. The footway and carriageway will either be covered with new material or the existing surface will be removed and replaced (as described above).

Preventative Maintenance Treatment Processes



Surface Dressing – Any defects in the carriageway are repaired ahead of the treatment. The road is then sprayed with a hot bitumen binder. This softens the road and seals the existing road. A layer of new stone chippings will then be spread over it and rolled. Because the surface is soft the chippings will bed into the binder and the existing surface. This will continue over the next few weeks under the normal traffic action.



Micro Asphalt – Any defects in the carriageway are repaired ahead of the treatment. It is usually laid in two layers, the first layer to fill any defects and regulate out any dips in the surface. The second layer provides the new surface. Micro Asphalt is laid as an emulsion, a mixture of bitumen mixed with crushed stone. It is laid cold and stays liquid for about 20 minutes before it sets (hardens) at which point the road can be opened to traffic.



Footway Surface Treatment (Slurry seal) – This involves the laying a thin layer of bitumen mixed with crushed stone over the top of the existing footway to seal the surface and extend its life.