Kersten
SITE MAINTENANCE EQUIPMENT

THE SURFACE MAINTENANCE HANDBOOK

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE & HOW TO TACKLE THEM

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INTRODUCTION

Over the last 15 years we have been asked to develop solutions for maintaining all kinds of surfaces, with many different challenges.

As a result of our experience, we have compiled a vast amount of knowledge and developed methodologies for keeping all these surfaces performing at their best.

This book is designed to be your year-round companion for all the outdoor surfaces under your care... whether you look after a school, a park, sports centre or country estate; this handbook will be an invaluable resource for keeping it all working throughout the year.

When it comes to surface maintenance – our philosophy is that ***"Prevention is always better than cure!"***

So we show you what the key performance properties of each surface are, how this relates to its objectives and ***the 3 biggest threats to surface performance .***

Tackling these threats is crucial to keeping the surface performing at its best, and is the cornerstone of our approach to site maintenance.

This approach allows you to prevent deterioration before it occurs, by treating the root cause of the problems, not just the symptoms, such as weeds, flooding and physical damage.

But never fear – if your surfaces have already succumbed to these threats and the moss or weeds have taken over, this book will also show you what must be done to cure the problem and get the surface performing well again. There are several reasons for the undesirability of weeds in these areas. Weeds can cause damage to the hard surfaces by breaking up asphalt and the edge of the road seal or enlarging cracks and thereby shortening their lifetimes (Holgersen, 1994; Zwerger et al., 2000). So prevention should be an absolute priority.

WHAT ARE THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE?

SURFACE COMPACTION

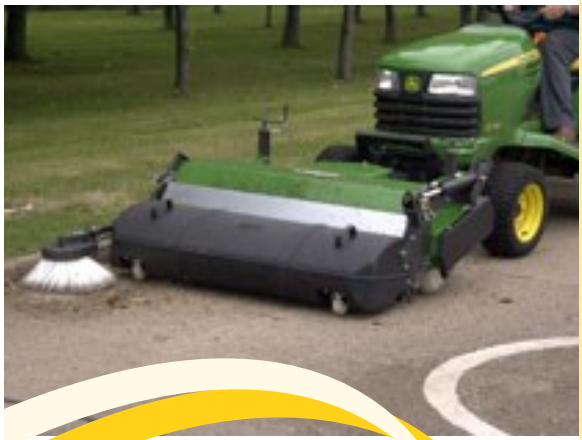
Surface compaction will occur because traffic has exerted excessive pressure on the surface and the contents of the surface have bonded more than they should under the pressure. This mainly leads to poor drainage, where surfaces that should be porous no longer allow water through.

DETRITUS BUILD UP

Detritus is made up of debris from trees, hedges, grass cuttings , litter and any other debris that should not be on the surface. This will block up the surface, affecting drainage and also rots down to provide a nutrient rich soil for weeds and moss to grow in.

SURFACE DISPLACEMENT

This is movement of the filling from one part of the surface to another, causing the surface to become uneven, with bare spots and mounds. Pedestrian and vehicular traffic will find it much more difficult to use the surface.



GENERAL PRINCIPLES

1. Performance properties

Most surfaces are designed to accomplish a specific set of objectives. To do this the surface will have several properties that allow it to perform certain functions and achieve the objectives.

These objectives are usually a mix of some of the following.;

1. ***Supporting the weight of traffic using the surface.***
2. ***Providing grip for surface users***
3. ***Removing surface water quickly to prevent flooding***
4. ***Providing a safe environment for users.***
5. ***To look great (providing kerb appeal)***

Each surface type is unique and has it's own mix of characteristics, but they can all be assessed in a similar way.

When maintaining a surface we need to consider all the functions that the surface is performing and look to maximize its ability to do each of them.

2. Threats to Performance

Each surface has a variety of threats to its performance properties. These threats are the things that will stop it performing its functions.

Sometimes the threat will be obvious, but other times it will be less easy to see until the surface is failing to achieve its objectives. On the whole there are usually only three core threats to performance that we must constantly battle against.

The 3 biggest threats are listed on the left of this page.

WHAT ARE THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE?

SURFACE COMPACTION

A gravel surface that has compacted from excessive traffic, resulting in puddling and potholes.

DETRITUS BUILD UP

Detritus is getting trapped at the edge of this tarmac surface and rotting down into an organic soil.

SURFACE DISPLACEMENT

Weeds and heavy traffic have displaced the surface, damaging the blocks and making them difficult to travel over.

Preventative maintenance is usually quite simple. Here, a sweeper is being used to lift a light layer of detritus

3. Prevention of Threats

Once we have established the performance properties of the surface and identified the threats to these, we can establish a maintenance regime that minimizes or eliminates the threats before they affect the performance of the surface.

Preventative maintenance is usually quite simple and not overly time or equipment intensive. In many cases it can be done with a rake, sweeper, blower and a set of loppers.

4. Remedial Work

Remedial work is a different story. It is usually much more time consuming and takes much heavier tools and machinery.

Remedial work is only necessary when the preventative measures have been neglected. Over time this allows the threats to take hold. Symptoms such as puddles and detritus become serious problems such as flooding, ditching and a jungle of weeds; rendering the surface incapable of performing its functions and achieving its objectives.

Even when we get this far, it is usually possible to regain surface performance by carrying out remedial work.

The same principles apply to all surfaces. Heavier machinery may be required on some surfaces more than others, but it is still a case of treating the same three threats; surface compaction, detritus build up and surface displacement.

Treating symptoms on their own, such as removing the water from flooding, or killing the weeds with herbicide does not treat the root cause of the problem, so the symptoms will inevitably persist.

WHAT ARE THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE?

SURFACE COMPACTION

The typical maintenance regime for preventing surface compaction is a regular rake through the material to loosen it up. Depending on the infil a stiffer metal rake, or a soft brush may be required. Continually loosening the surface is the only way to ensure it does not compact and prevent drainage.

DETRITUS BUILD UP

Detritus can be swept, raked and blown on most surfaces. A regular process of litter picking and collecting debris is essential to successful management of detritus buildup. But when done on a frequent schedule the task becomes extremely simple.

SURFACE DISPLACEMENT

Surface displacement can usually be minimized by dragging loose material from high spots back into low spots. The more frequently this is done, the easier it will be to manage. Sometimes (like in block paving) the prevention is a little different.

APPLYING THE PRINCIPLES

Each outdoor surface has its own set of performance properties and the same threats apply to lesser or greater degrees in all of them.

Therefore we can prevent these threats from becoming established problems by implementing similar maintenance regimes for a variety of surfaces, simply tweaking the regime to suit different surfaces.

Throughout this book we will detail the specific performance properties of different surface types, identify the potential threats to those properties and then Identify preventive maintenance procedures that will keep the surface performing at its best.

We will also show what remedial measures can be taken when preventative measures have been neglected and the surface is no longer able to perform its functions.

It is our hope that this approach to surface maintenance will result in much better informed grounds staff across the UK, and better performing surfaces as a result.

We also know from customer studies that implementing these kinds of regimes can dramatically reduce the complaints about weeds and poor surfaces (Edinburgh Council Transport and Environment Committee, 2017) so there are big social consequences to getting it right too.

Let's get started!

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON GRAVEL?

SURFACE COMPACTION

This is caused by a mixture of traffic on the surface and rain washing mud into the top gravel layer. Surface compaction means that water cannot drain through the surface properly, so symptoms will include puddles and the surface becoming uneven. If left untreated it will lead to potholes and flooding of the surface.

DETRITUS BUILD UP

Detritus is usually a mixture of organic material such as leaves and twigs falling from trees, grass cuttings and animal droppings. Gravel is a great catchment area for small pieces of detritus. Eventually this detritus rots down and forms a layer of soil in the gravel. At first this will add to your surface drainage problems, but it also provides a nutrient rich growth environment for moss and weeds to establish themselves in the gravel surface - on top of the semi-permeable membrane. Eventually this will result in a jungle of weeds growing in your gravel .

SURFACE DISPLACEMENT

Gravel is a loose surface, and therefore the traffic driving or walking over the surface will move the surface filling around. Where traffic is heavy the material will become displaced and it will build up in areas with less traffic. This will make the surface uneven and if left untreated will lead to potholes or ditches in the surface, making it difficult to travel over.

GRAVEL

PERFORMANCE PROPERTIES

Gravel surfaces are usually designed for light vehicles and pedestrians to use.

A gravel path will normally comprise of several layers of material.

The bottom layer will be a semi-permeable membrane. This **prevents mud and weeds from coming up** through the compacted surface into the top surface, while still **allowing water to drain away.**

The middle layer will usually be a compacted base of hard-core. This layer provides a solid base that **keeps its shape** when traffic drives or walks over the surface. It is also porous, allowing water to flow through the surface and run away underneath (usually to a nearby ditch).

The third layer is the gravel itself; which **provides a grippy surface** for people to walk or drive over, this is also designed to look smart and allow water to drain easily.

When maintaining this surface we need to consider all the functions that the surface is performing and look to maximize its ability to do so.

PREVENTION OF THREATS

Let's take a look at our gravel surface again and see how we can treat these threats before the symptoms become severe.

Surface compaction

To prevent surface compaction is simple, we only need to rake the gravel on a regular basis in order to keep the surface loose and even. This will allow it to drain and support traffic correctly.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON GRAVEL?

SURFACE COMPACTION

Regular decompaction of the gravel can be carried out with a rake or one of our gravel path renovators.

DETRITUS BUILD UP

Gravel makes a perfect place for leaves to get trapped and rot down. Removing them before this occurs is essential.

SURFACE DISPLACEMENT

Surface displacement and compaction often go hand in hand, and both can be addressed with the same tools.

When preventative action has not been taken, the gravel surface can be renovated with a Heavy duty attachment.

Detritus build up

Detritus build up requires us to look at several things. First is reducing the volume of detritus falling into the surface in the first place. For example you can prune dead branches on nearby trees and collect grass clippings on the border of the gravel. However, detritus will invariably find it's way into the surface no matter how effective you are at these measures, so you must regularly remove it from the surface. This can be done with a blower or a rake.

Surface displacement

Once again this is an easy fix. The displaced material can be raked back into low spots to leave an even surface. Traffic can also be directed a certain way to minimize displacement.

REMEDIAL WORK

Surface compaction

When the surface has become too compacted for a rake to penetrate this will result in flooding whenever it rains. We need to use a heavy attachment to de-compact the gravel. Kersten offer such a machine, called a gravel path renovator. The knives in the tool will loosen even heavily compacted gravel surfaces allowing them to drain again.

Detritus build up

Once substantial detritus has been allowed to build up and rot down in the surface, weeds and moss will grow. These need to be removed along with the soil and detritus in the surface. We offer a heavy duty tool for accomplishing this.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON GRAVEL?

SURFACE COMPACTION

It doesn't take much time with our path renovator to restore a path, allowing easy access and free drainage.

DETRITUS BUILD UP

A weed burner is an ideal tool for weed killing on gravel.

SURFACE DISPLACEMENT

Even displacement and compaction by heavy machinery can be addressed very quickly

A very heavily compacted surface can be loosened by the Gravel Path Renovator.

The gravel path renovator mentioned before has specially shaped knives which cut under the roots of the moss and weeds, lifting them to the surface. Once on the surface they can be raked or blown away.

Harrowing (or similar disruptive methods such as the more refined machine suggested) is the most effective non-chemical control method for weeds on gravel surfaces and can be carried out at relatively low cost (Svensson & Schroeder, 1992; Tvedt et al., 2000). In Denmark, the use of chemicals was banned on churchyards in 1992 and harrowing the gravel surfaces has been the most used weed control method in these areas (Tvedt et al., 2000).

Weed Burning can also be useful on gravel, and other surfaces as spot treatment once the bulk of the detritus and weeds have been removed from the surface.

Note; As much detritus and soil must be removed as possible to prevent further weed growth. Sometimes a pressure washer can be used after the weeds have been removed and the surface de-compacted in order to wash away excess soil that can be missed by raking and is too heavy for a blower.

Surface displacement

Excess surface displacement on its own is still best remedied by a rake, although in our experience this doesn't usually occur in isolation, and the gravel path renovator can handle this job at the same time as de-compacting the gravel and lifting the weeds to the surface.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON ARTIFICIAL GRASS?

SURFACE COMPACTION

The grass pile and surface infill get heavy traffic when the surface is in use. This results in the pile being trodden flat and the infill compacting between the strands. Over time the compaction will lead to drainage problems. The surface will also become hard and uneven; making it less enjoyable to play on. If left untreated the surface will flood and play will be very difficult.

DETRITUS BUILD UP

Playing surfaces are often placed near large hedges and trees, where detritus can easily be blown onto the surface. Players also contribute by walking dirty boots onto the grass from nearby grass or dropping litter.

If left on the surface the detritus will be trodden into the mat and will rot down, blocking up the surface, which will prevent drainage and providing an ideal growth medium for moss and weeds.

SURFACE DISPLACEMENT

The filling in the mat is loose and light. Therefore heavy traffic displaces the infill, especially in areas of heavy play, such as goal mouths. If left untreated the surface will become very uneven, causing balls to deflect in odd ways and players to trip.

A wide brush or drag brush can be used to stand up the grass pile and redistribute the infill for a smooth surface.

ARTIFICIAL GRASS

PERFORMANCE PROPERTIES

Artificial grass is generally designed for use in sports surfaces. As such, it must perform several tasks to a high standard.

1. ***An even surface for players to run over, allowing the ball to play as expected.***
2. ***Provide grip for players.***
3. ***Drain quickly so the pitch can be used for as many hours as possible.***
4. ***Provide a relatively soft , even landing with no sharp objects.***
5. ***Look attractive to players and spectators.***

There are several variations of artificial grass. However, their composition is usually quite similar.

There will be a solid hard-core or similar base, covered by sand to provide an even foundation for the surface. This base is covered by a porous mat with the appearance of grass. The mat will be woven or perforated to allow fast drainage. In between the pile (grass strands) will be a filling; such as rubber crumb or sand. This is used to keep the grass pile upright and even, as well as providing a soft landing for players.

TREATMENT

A regular preventative maintenance regime is very simple and easily implemented.

Surface compaction can be easily prevented by using a powered sweeper over areas of heavy traffic and a drag mat or static brush over other areas to keep the infill loose.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON ARTIFICIAL GRASS?

SURFACE COMPACTION

Under the moss this surface has become very compacted, the sweeper can deal with the moss and compacted infill.

DETRITUS BUILD UP

Detritus can be lifted from the surface and collected by a sweeper.

SURFACE DISPLACEMENT

The rubber crumb infill has been forced to the edges and needs moving back into the play area with a sweeper.

Moss can be lifted from the pile, and then the infill can be de-compacted by the powered sweeper

Detritus build up can be prevented by sweeping also. A filter collector can be used to allow infill through while larger detritus is collected. Other measures can also help, such as keeping the route to and from the surface swept to minimize dirt brought onto the surface by players boots. Nearby trees should be regularly pruned to reduce leaf and twig fall and leaves should be collected.

Surface displacement can be easily treated with a drag mat or static brush, which can redistribute the infill evenly across the surface.

REMEDIAL WORK

If regular maintenance has been neglected we have often come across surfaces which are very compacted and covered with moss.

This can be remedied by using a Kersten powered sweeper; removing the moss and detritus along with some of the infill. The brush can then be used to get deep into the pile and de-compact the remaining infill. Additional infill may be needed to top up what has been removed.

In extreme situations we have also had to use a Kersten Weed brush with wire bristles to remove the moss and de-compact the surface.

This should only be used as a last resort! It is a very aggressive method and can damage the surface if used too heavily.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON BLOCK PAVING?

SURFACE COMPACTION

Provided the surface is laid properly, surface compaction is not usually an issue. However, similar drainage issues can occur due to joints getting blocked by detritus.

DETRITUS BUILD UP

The gaps between the blocks provide a perfect catchment area for detritus, which will settle in the gaps and rot down. This will prevent the surface from draining properly and will lead to puddles on the surface. The rotten detritus is also a perfect growth medium for moss and weeds, which will grow between the gaps, and eventually on the top of the blocks if left untreated.

SURFACE DISPLACEMENT

If moss is left in between the gaps it can cause serious problems. Moss absorbs a lot of water. When the water freezes it expands which can force the blocks apart and eventually damage the surface.

Some maintenance methods can also cause surface displacement. Pressure washing is a common method of cleaning block paving, but it will remove the sand between the blocks if great care is not taken, which gives them space to move.

A weed brush can remove moss and detritus from between the blocks without lifting all the sand. Leaving the surface stable and blocks unlikely to displace.

BLOCK PAVING

PERFORMANCE PROPERTIES

Block paving is an extremely common surface in car parks across the UK and Europe. It is ideally suited for the purpose due to the ease with which it can be laid.
As its main use is in car parks, the following criteria are essential.

1. ***It must provide a smooth stable, long lasting surface***
2. ***It must provide good grip for vehicles and pedestrians.***
3. ***It must drain quickly.***
4. ***It must look attractive.***

Block paving is normally laid on a base of hard-core and sand, which can support the heavy traffic without giving way. The blocks are spaced a little apart to allow drainage and the gaps between blocks are typically filled with sand.

TREATMENT

Regular maintenance is simple and effective. A powered sweeper and collector can be used to collect detritus before it rots down. A blower can also be used to move small debris from between the gaps.

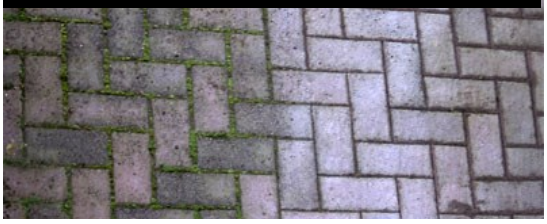
Trees and hedges near to the block paving should be pruned regularly in order to prevent leaves and twigs from falling onto the surface.

Grass cuttings close to the surface should be collected to prevent migration of the cuttings onto the blocks.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON BLOCK PAVING?

SURFACE COMPACTION

Before and after weed brushing. The soil and moss is compacting in the gap. Once removed the surface can drain

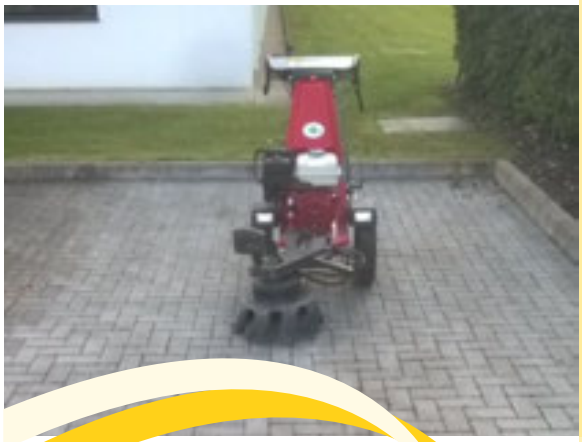


DETRITUS BUILD UP

Detritus can be lifted from the surface and collected by a sweeper.

SURFACE DISPLACEMENT

Pressure washing can be used to lift the moss, but it will also lift the sand, so care must be taken.



Not only does a weed brush lift out the moss, it removes much of the grime from the top of the blocks too.

REMEDIAL WORK

When the surface has been neglected, we have often found moss between the blocks and black sticky areas where puddling has occurred. In these cases a Kersten weed brush can be used to lift the moss and detritus from between the blocks. The arisings can then be collected with a powered sweeper and collector.

In some cases, sand will need to be taken out from between the blocks in order to brush at the required depth to remove all the soil and moss, in which case this sand will need to be topped up again to prevent surface displacement. Sand can be worked into the blocks with a powered sweeper.

Once remedial work is complete you can then return to a regular sweeping regime, which will prevent the moss from taking over again.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON TARMAC & CONCRETE?

SURFACE COMPACTION

Due to the non-permeable properties of the surface, compaction is not really an issue on this surface unless there is a major issue with the base.

DETRITUS BUILD UP

Detritus is the largest threat to tarmac and concrete. The gullies and pavement edges provide the perfect place for detritus to gather and rot down. This provides an ideal growth medium for moss, weeds and extension of the grass verge. If not treated this will block up the gullies and cause flooding where the water cannot run off.
Untreated pavement edges will result in reduced width for pedestrians, prams and wheelchairs.

SURFACE DISPLACEMENT

Roots from weeds can penetrate the surface and form cracks in their attempt to find more fertile ground. This can result in crumbling and surface deterioration.

Once the surface has begun to deteriorate in this way, more segments will crumble away and migrate across the surface, leaving potholes and cracks.

On Tarmac and Concrete, a sweeper will often deal with the majority of surface issues.

TARMAC & CONCRETE

PERFORMANCE PROPERTIES

Tarmac and concrete are both commonly used in roads and service yards, which have heavy traffic moving on them all day. In some ways these are the simplest surfaces to maintain. However, we have seen a lack of maintenance cause serious damage. Especially on pavements next to grass or other vegetation.

Tarmac and concrete must;

1. provide a smooth surface for supporting traffic
2. Provide good grip for vehicles and pedestrians
3. Look attractive

Tarmac and Concrete are usually laid by heavy machinery on top of an extremely compacted hard-core base. Drainage is usually achieved using a camber and gullies.

TREATMENT

Treatment is a fairly simple process of regular maintenance with a powered sweeper and collector. This will remove the detritus before it rots down and weeds get a chance to become established.

The edges of pavements can be treated to a light weed brush to prevent turf from encroaching on the pavement. The arisings can then be collected by a powered sweeper and collector.

A gully brush makes light work of sweeping debris trapped in kerb edges into the path of the main brush to be collected.

THE 3 BIGGEST THREATS TO SURFACE PERFORMANCE ON TARMAC & CONCRETE?

SURFACE COMPACTION

Compaction is not usually an issue, so here's another picture showing off our weed brush removing excess turf.

DETRITUS BUILD UP

Detritus can be lifted from the surface and collected by a sweeper.

SURFACE DISPLACEMENT

If left untreated, weeds can seriously damage the integrity of the surface, causing potholes like this one.

REMEDIAL WORK

If left untreated, moss and weeds will become prevalent; especially in gullies and pavement edges. Verges will encroach upon pavement space. In some cases we have come across pavement that has been reduced by as much as 18 inches with solid soil and turf, and moss or other weeds covering the entire pavement.

A powerful Kersten weed brush is required to remove this material from the surface, after which the arisings can be collected by shovels and a powered sweeper and collector.

Hopefully it is now clear to see that a good maintenance regime is the most effective way to take care of your hard surfaces and keep them performing at their best. And it needn't cost the earth.

Simply spraying weed killer after the weeds have emerged, or getting rid of surface water with a pump is analogous to treating a person that has an open wound with a pain killer. You have removed the pain, (for now) but the person is still bleeding. The underlying problem still exists.

Sweeping the surfaces regularly for maintenance will remove dirt and thereby reduce the possibilities for weed establishment (Hein, 1990; Hansen et al., 2004; Schroeder & Hansson, 2006). But I must emphasize the need for a "REGULAR" maintenance regime. The more often you can sweep, rake and clean - the better your surfaces will retain their performance.

THE 4 BIGGEST THREATS TO SURFACE PERFORMANCE ON GRASS?

SURFACE COMPACTION

The surface drainage often relies on processes such as aeration in order to work. Heavy footfall over the surface is enough to undo much of the work of the aerator and compact the surface again, preventing proper drainage. The grass can also fold over, making it difficult to cut and therefore it grows sideways and weaves together forming a clumpy, uneven mat.

DETRITUS BUILD UP

Detritus can build up on the surface in the same way as in artificial grass, however here the problem is generally greater as the organic base is already a perfect place for weeds and moss to become established.

SURFACE DISPLACEMENT

Soil is very soft and is easily displaced by heavy traffic if it is wet. This can leave the surface very uneven with ditches and lumps appearing over time.

GRASS GROWS CONTINUALLY

Unlike other surfaces we have discussed grass has the added element of natural growth, which must be kept on top of, or it will become an unuseable surface.

On Tarmac and Concrete, a sweeper will often deal with the majority of surface issues.

GRASS

PERFORMANCE PROPERTIES

Of all the surfaces discussed in this handbook, grass gets the most attention from grounds maintenance teams. Probably because of the incredible marketing efforts of mower manufacturers and its proliferation in televised sporting events. I hope you can see from the above information that other surfaces deserve just as much attention in order to keep them performing at their best.

Grass is used in areas with predominantly pedestrian traffic, such as gardens, sports pitches and parks. The surface must mainly perform similar functions to artificial grass.

1. An even surface for players to run over, allowing the ball to play as expected.
2. Provide grip for players
3. Drain quickly so the pitch can be used for as many hours as possible.
4. Provide a relatively soft , even landing with no sharp objects
5. Look attractive to players and spectators.

The way this is achieved is a little different. Usually the surface is simply a soil or sand/soil mix on top of a firm organic base. The top is either grass; seeded straight into the soil, or turf, which is pre-established and then laid on top of the soil.

Drainage depends upon the soil type and processes such as aeration to create channels through which water can drain.

THE 4 BIGGEST THREATS TO SURFACE PERFORMANCE ON GRASS?

SURFACE COMPACTION

Compaction can be addressed by aeration. It is a good idea to fill the holes with sand to increase stability.

DETRITUS BUILD UP

Detritus and moss can be lifted from the surface and collected by a sweeper or Scarifier.

SURFACE DISPLACEMENT

A surface roller can be used to even out surface displacement.

TREATMENT

Grass is probably the most difficult surface on which to implement a successful maintenance regime. This is because of the organic nature of the surface.

1. Surface compaction

As mentioned, drainage can be improved by regular aeration of the surface. It can be beneficial to add sand into the holes in order to prolong their effectiveness and make the ground more stable. Aerating is usually achieved with a heavy machine, therefore the surface should be reasonably dry before any maintenance tasks are carried out to avoid unnecessary damage.

2. Detritus build up

Grass can be effectively treated with certain herbicides to reduce weed growth, in addition to this, a regular scarification process will thin out the thatch and remove any moss. The moss and thatch can then be collected by a powered sweeper and collector or in a mower.

3. Surface displacement

The main cause of this is play and maintenance carried out in wet conditions. If possible it is better to carry out work in dry conditions. However, a little surface displacement can be fixed with a roller.

4. Cutting the grass

The grass should first be brushed or sucked into an upright position , this is easiest on a dry day. Once upright the grass can be cut. Cutting should be carried out in the late afternoon if possible as this puts the least stress on the grass.

THE 4 BIGGEST THREATS TO SURFACE PERFORMANCE ON GRASS?

CYLINDER MOWER

A cylinder mower slices the grass between two blades, like a pair of scissors, leaving a clean cut.

Kersten K2100 and KCM976 Cylinder mower attachment

ROTARY MOWER

A rotary mower uses one blade, typically tearing the grass at the desired height. It is typically lower cost and has a higher work rate.

FLAIL MOWER

A flail mower uses a cylinder with hanging blades to hack down dense vegetation and long grass.

A cylinder cut is better for the grass than a rotary mower, as it cuts the grass rather than tearing it, which puts less stress on the grass. However, this depends on what finish is required and your budget.

After cutting you can choose to roll the grass to achieve a stripe, or leave it upright. Cuttings can be collected, or mulched into the remaining grass to promote growth and reduce the time taken up by emptying the collector. However, if mulching - it is essential to cut no more than 1/3 of the grass in order to hide the cuttings in the remaining thatch.

Grass should be cut every few days. Only taking a small amount every time. A few days is needed for the grass to recover between cuts.

Plenty of water is essential for healthy grass.

REMEDIAL WORK

If grass is left too long before cutting it can get very thick and unwieldy to cut with a rotary or cylinder mower.

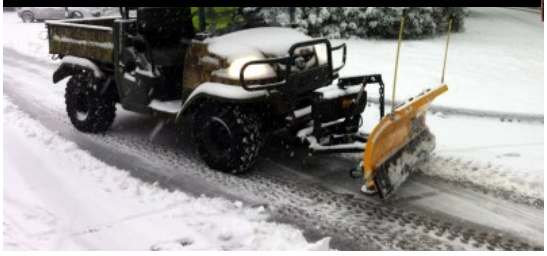
In this case a heavy duty flail mower can be used in order to take the grass to a manageable height.

A scarification process can then be carried out to thin the grass and remove moss. Then a rake and a powered sweeper and collector can be used to collect excess material from the surface

TACKLING THE ADDITIONAL CHALLENGES THE SEASONS BRING US.

SNOW

Snow can prevent surfaces from providing proper grip and also make them difficult to travel over.



LEAVES

Leaf fall is one of the largest contributors to the threat of detritus build up.

HEAVY VEGETATION

Heavy vegetation is a mess. But it can easily be brought under control with the right tools.

SEASONAL CHALLENGES

Throughout the year we often come up against specific seasonal challenges to maintaining different surfaces. These challenges can all be easily overcome using certain specialized methods and equipment.

It should also be noted that the size of equipment is directly related to the size of the area being maintained and the time available for carrying out maintenance.

Some of the main seasonal challenges we face are;

- ***SNOW***
- ***LEAVES***
- ***DUST***
- ***MUD***
- ***LITTER***
- ***HEAVY VEGETATION***

We will lay out some useful guidance below to aid in combating these common seasonal challenges.

TACKLING THE ADDITIONAL CHALLENGES THE SEASONS BRING US.

SALT SPREADERS

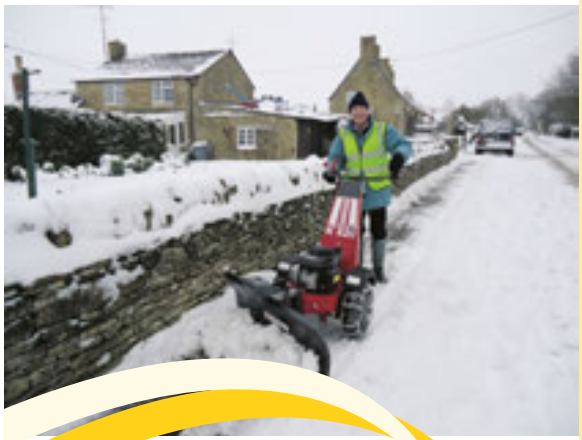
Putting down salt or brine is good preparation to prevent ice and stop light snow from landing.

SNOW PLOUGHS

Snow Ploughs can be used after the event to move snow around, allowing you to clear paths for traffic.

SNOW BLOWERS

A Snow Blower can be used in situations where the snow is too deep or compacted for a snow plough.



SNOW

Having a good plan for dealing with snow is essential for keeping your site accessible during winter. If staff, customers or students can't get in, it can cost a fortune.

Preparation is the key to good snow and ice management. Here are the essential ingredients for your plan;

1. Decide which areas and pathways need to be kept clear.

2. Assign a member of staff to clearing each section. (Snow doesn't clear itself!)

3. Evaluate how much salt you will need to put down and at what temperature.

4. What will the staff use to spread the salt? This will be determined by how much salt is required and how much time you have to cover the area. Spreaders come in all shapes and sizes.

5. What will the staff use to clear snow in their designated areas? Does it require a shovel, a plough or a snow blower? What size?

6. Where will they pile up the snow? (No it doesn't just disappear) you need to mark out designated spots that won't block traffic.

7. It is important to mark out edges that can be damaged by ploughing, as these may be hidden by snow fall.

It is best to make this plan and purchase any equipment by the summer when you have plenty of time to get it organized, as there is always a flurry of people panic buying when the snow is falling.

Having a good plan in place will allow you to keep your site accessible whatever the weather.

TACKLING THE ADDITIONAL CHALLENGES THE SEASONS BRING US.

LEAF BLOWING

Blowing can be an effective way to manage leaves. But, it is important that you have somewhere for them to go!

SWEEPING

Much of the time, leaves can be swept and collected. By a similar method to other debris.

ROAD SWEEPING

Sometimes though, the job requires something a little larger like a road sweeper.

LEAVES

If detritus build up is the largest threat to your surface performance (which is true for most of the surfaces we have discussed) then leaves are potentially your biggest concern, and managing them in Autumn is no easy task!

Once again, having a good plan is the key to good leaf management.

1. Identify the trees that will drop leaves during autumn.

2. If possible prune back some of the branches to minimize leaf fall

3. Set up catchment areas for leaves to prevent them migrating onto hard surfaces where they can decompose quickly.

4. Assign staff members to certain leaf fall areas.

5. Determine what equipment is needed to collect the leaves. Again this can be determined by the size of the area and the time available. Will you need a rake and barrow, or a sweeping lorry?

6. Where will you put the collected leaves? Will you compost them? Or will they be taken away by a licensed firm?

it is important to order any machinery in advance of autumn, as there is usually a mad panic purchase by under prepared grounds teams who need machinery when leaves are already on the ground, which creates longer waiting times.

When you have a plan in place, you can deal with the leaves quickly and effectively.

One thing to note is that noisy leaf blowers are not always appreciated by staff and students during lessons or hospital patients trapped in bed. Quiet models are on the market and might be more appropriate for your site.

TACKLING THE ADDITIONAL CHALLENGES THE SEASONS BRING US.

DUST SUPRESSION

A machine can be fitted with a dust suppression kit, which sprays water onto the brush.

DEBRIS GUARDS

A guard can be fitted to the brush, which catches a large proportion of the dust and other light debris.

SPRAY THE BRUSH

It is more effective to saturate the brush, than the ground. The dust will then cling to the brush and make less mess.

DUST

During the summer months sites often become dust bowls. Carrying out site maintenance in these conditions is still essential, but how can we deal with the dust?

Your own safety is a priority. Make sure dust masks are used when carrying out site maintenance tasks that can lead to large amounts of dust inhalation.

A brush guard can also be fitted to contain the dust and light debris to the area just in front of the brush and reduce the dust inhaled by the operator and bystanders.

Water is our friend for combating dust. When dust comes in to contact with sprayed water, it binds and makes the material heavier. We can either wet the ground before we sweep, or spray directly onto the brush.

The dust can then be swept into a collector without spreading everywhere. Some of the latest sweepers apply water to the brush, rather than directly onto the ground, which creates the same result with less potential for mess.

Collecting the dust will reduce the amount blown around and save cleaning staff a lot of headaches.

TACKLING THE ADDITIONAL CHALLENGES THE SEASONS BRING US.

BRUSH STATIONS

Below is an example of a brush station for cleaning footwear

SWEEPING

Mud can be kept on top of by sweeping and collecting it from surfaces where it doesn't belong.

SCRAPING BAR

A scraping bar can be fitted to the front of a sweeper to loosen stubborn mud before it is swept.

MUD

In Winter and often around the coast we have the opposite problem. Mud is spread by vehicles, pedestrians and water from fields and vegetated areas onto hard surfaces.

This surface migration is made worse by heavy rain fall.

Again, prevention is better than cure here. Some things you can do include installing brush stations for cleaning boots and setting up artificial catchment areas for mud being carried by water.

Inevitably some mud will find its way onto your hard surfaces. The best way to keep the surfaces clean is with a good sweeping regime. Mud can be swept and collected by a powered sweeper and collector.

Any heavy mud can be loosened with a scraper, which fits to many of our sweepers, or the weed brush can be used to loosen really stubborn mud and then it can be collected in the same way.

TACKLING THE ADDITIONAL CHALLENGES THE SEASONS BRING US.

LITTER BINS

A good system of bins is the best preventative measure you can take.

POWERED SWEEPER

A powered sweeper is a great way to increase the effectiveness of a manual litter picking effort.

VACUUMS

Vacuum machines can also be an effective solution for managing litter and other loose material.

LITTER

Litter is a man made from of detritus and can cause the same problems as organic detritus.

Your most effective strategy against littering is to prevent it in the first place with a good system of bins that are regularly emptied. However, not all human beings have the mental capacity to use your bins, and sometimes rodents or the wind will empty them for you.

Depending on the size of your site, you can implement a manual litter picking plan. Or you can combat it as part of a regular sweeping regime.

A powered sweeper and collector is capable of dealing with the collection of most litter. And will be much quicker and less back breaking than a manual litter picking effort. Vacuum machines can also be effective, especially for larger items such as cans and bottles.

TACKLING THE ADDITIONAL CHALLENGES THE SEASONS BRING US.

FLAIL MOWER

The typical tool for getting heavy vegetation under control is the flail mower.

ROTARY MOWER

A rotary mower can be suitable for areas with less of a problem. The work rate is generally faster.

WHOLE CROP MOWERS

Sometimes you want to keep the whole crop, in this case a drum mower, or reciprocating knife mower can be used.

HEAVY VEGETATION

Some areas of your site are probably covered by fast growing vegetation such as nettles, brambles, thistles and other weeds. These weeds cannot usually be tackled by an ordinary mower.

Depending upon the size of the area you are trying to tackle, these can be dealt with using strimmers, or on larger areas a flail mower will make the job much faster.

When using a flail it is important to determine the finish that you require. Y type blades will typically deal with heavier material. However the finish will usually be better with boot type flails.

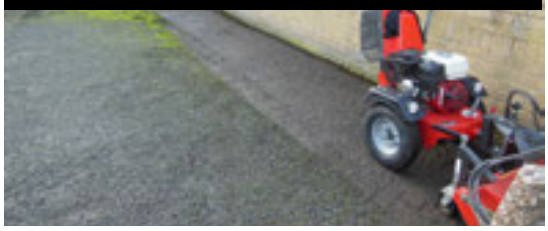
Herbicide can be effectively used to treat areas such as this to prevent rapid regrowth.

Some weeds, such as Japanese knotweed require treatment by specialists and should not be attempted on your own.

NOTES ON HERBICIDE USE IN CONTROLLING WEEDS.

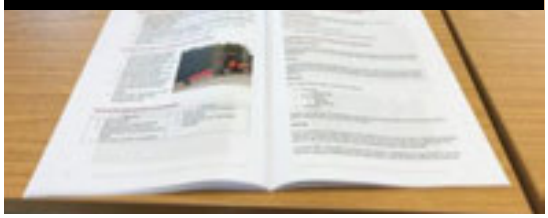
SHOULD WE SPRAY?

We have to consider if it is the right place to be spraying chemicals. Where will the chemicals drain to? Can we achieve the same or better result through other means?



AN INTEGRATED APPROACH

We are proud to have worked on Lantra's new Awareness of Integrated Weed Management training course. To help people create an effective weed management regime.



SWEEPING

Removing detritus from hard surfaces by sweeping is the best long term solution for retaining surface performance.

NOTES ON HERBICIDE USE

Herbicides have been extremely popular in site maintenance applications over the past few decades. In some ways they are seen as a golden bullet cure-all. However, we are asked to help time and again on sites where it is not working as an effective solution.

Herbicides can be a good aid to the weed clearing effort, and an important part of an integrated approach to weed control. But often, a good sweeping regime should be the focus of a preventative approach. Sweeping treats the cause of the problem. (Detritus build up) where as herbicide only treats the symptom (weed growth).

Most outdoor surfaces are meant to drain or run off to drainage. This is a problem when using pesticides and Water-quality monitoring studies have demonstrated that there is a disproportionate contamination of waters by non-agricultural pesticide use (Nitschke & Schüssler, 1998; Lotz et al., 2000; Augustin, 2003b; Skark et al., 2004).

By the time weeds have appeared; your surface is already underperforming several of its key functions, such as drainage, grip and kerb appeal. Killing the weeds does not bring performance of the surface back to the required level, it only delays further weed growth. We need to remove the detritus build up and the weeds to allow the surface to perform at its peak level again.

Correct training and PPE are essential for all site maintenance tasks, not only the application of herbicides. Equipment manufacturers are a good source for training and advice. As are professional bodies such as LANTRA and The Amenity Forum, which we contribute to.

FIELD NOTES

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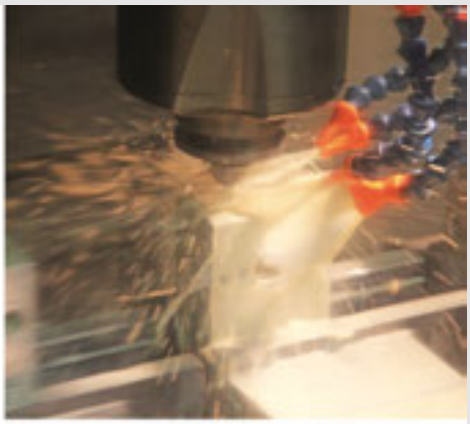

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