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CENTRAL RETAIL PARK

PLANIT

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LANDSCAPE MANAGEMENT PLAN | PRINCIPLES

There should be a commitment to the ongoing high quality management and maintenance of the public realm. The long-term success of any landscape is reliant upon a detailed understanding of the parts and how they go together but this is just the start of the journey and perhaps the most important aspect, invariably overlooked, is to ensure that there is a defined and committed programme of maintenance.

BRIEF

The brief below describes the framework:

- The management plan will cover a time period of 5 years
- The Management Plan must give consideration to environmentally sensitive design and management
- The conservation of existing features will be a prime consideration
- The Management Plan will seek to provide a net increase in the nature conservation value of the site

MONITORING

The Management Plan's life span has been divided into key stages of 5 yearly intervals. These will be used as the basis for developing the plan and setting reviewing targets.

Monitoring is of fundamental importance, since this is the means by which the success of the plan will be measured. It is therefore important to establish standardised survey and monitoring methods, which enable valid year on year comparisons to be made. There will be a need for flexibility during its implementation. The Management Plan must be an evolving one, able to adapt to the specific needs of the space.

MANAGEMENT PRINCIPLES

Softworks:

To prescribe all necessary management and maintenance principles and management tasks to enable successful establishment and ensure the continued maturing of all landscape elements.

- To ensure the continuing health of existing vegetation
- To ensure the successful integration of existing and proposed vegetation
- To ensure that the management and maintenance regime is appropriate to the site
- To provide a mechanism for the ongoing monitoring and reviewing of the management plan and the specific maintenance operations contained therein.

A number of separate, yet inter related, vegetation types exist and are proposed for the site:

- Proposed amenity grass
- Proposed wildflower meadow
- Proposed ornamental shrub planting
- Proposed tree planting

Hardworks:

- To put in place procedures for regular inspections of all paved areas.
- To outline specification and requirements for work by Public Utilities and general surface reinstatement
- To outline specification and sources of materials for repair/reinstatement (NBS Spec Public Realm)
- To establish winter maintenance procedures
- To put in place procedures for street cleaning
- To outline procedures for the maintenance of Street Furniture

1.0 SOFTWORKS | MAINTENANCE

A Health and Safety plan is an important consideration for any area of public realm. The landscape maintenance team will be expected to produce a risk assessment and method statement for the maintenance of the planting areas.

Highways

Maintenance works associated with works adjacent to highways will need to be considered as part of the general management and maintenance procedures

Chemicals

Chemicals generally should be restricted in use. All chemicals, herbicides, pesticides and fertilisers, should be approved by English Nature and should be used, stored and disposed of in accordance with EN guidelines and COSHH Regulations 2002.

MAINTENANCE OPERATIONS

Set out in the tables overleaf are the maintenance operations that should be carried out over the next 15 years in order to achieve the design objectives. They have been set out in a format that can be easily followed by all parties, ensuring that the Management Plan exists and a working document and not an archived report. The management prescriptions are flexible such that each section can be changed and updated on an annual basis, allowing targets to be set, progress monitored and accurate reporting made.

PROJECTED MAINTENANCE

The tree species have been carefully chosen for their suitability to the location. Formative pruning has already been carried out on the nursery and this will produce suitable growth and canopy shape for the space provided.

In the event of any structural damage to the trees by unknown circumstances such as an extreme weather event the following guidelines should be observed:

Where possible, pruning should be carried out in the dormant season to avoid excessive sap loss.

Irrigation

Irrigation of the trees and shrub areas particularly during the first 3 years will be fundamental to their long term successful establishment.

NUTRITION

The tree pits have been backfilled with a suitable growing medium containing nutrition sufficient for the initial period of establishment.

After three years it would be advisable to apply an application of fertiliser in the Spring as a top dressing. A broad spectrum fertiliser such as HortiTop Complete (available from Hortifeeds) would be suitable. A routine soil test carried out every 2 years would establish the need for any supplementary fertiliser.

Trees with hard standing should have a liquid fertiliser applied annually during spring.

MANAGEMENT PRINCIPLES

Proposed individual trees:

- To ensure satisfactory establishment and continuing health.
- To maintain the plants in a healthy condition and develop the site tree structure.
- To ensure the successful establishment and continuity of the overall design concept.
- To establish a valued and appropriate amenity.

Amenity grass:

- To ensure the successful establishment of the sward
- To maintain a healthy and attractive sward that is fit for purpose and anticipated use
- To prevent the spread of woody vegetation from structure planting and ornamental shrub areas
- To control undesirable herbaceous species
- To maintain the integrity of the grass mix specified and remove any non-native self seeded material

Ornamental, herbaceous, planting:

- To ensure satisfactory establishment and continuing health
- To maintain plants in a healthy and attractive condition
- To ensure the successful establishment and continuity of the overall design concept.
- To establish a mechanism for the replacement of any failing plant or one which has reached maturity
- To ensure planting within public areas is maintained below a maximum height of 1m to meet the guidance set within Secure by Design with the exception of wall mounted climbers.

1.2 SOFTWORKS | TREE WORK

MAINTENANCE OPERATION

- **Identification:** Before starting work agree which trees are to be removed or pruned
- **Protection:** Avoid damage to neighbouring trees, plants and buildings
- **Standards:** To BS 3998 and Health & Safety Executive (HSE) 'Forestry and arboriculture safety leaflets'
- **Removing branches:** Cut as shown in Arboricultural Association Leaflet No 8 'Mature tree maintenance'. Cut vertical branches similarly, with no more slope on the cut surface than is necessary to shed rainwater
- **Appearance:** Leave trees with a well balanced natural appearance
- **Chain saw work:** Operatives must hold a Certificate of Competence
- **Tree work:** To be carried out by an approved member of the Arboricultural Association

ADDITIONAL WORK

- Defective, diseased, unsafe or weak parts of trees additional to those scheduled for attention: Give notice if detected.

PREVENTION OF WOUND BLEEDING

- **Standard:** To BS 3998, clause 8.

PREVENTION OF DISEASE TRANSMISSION

- **Standard:** To BS 3998, clause 9 and Appendix B.

WATER RESTRICTIONS

- **General:** If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
	TREE PLANTING			
	Maintenance during defects liability period of 5 years after planting whichever is the greater	1 – 5	As required	2 March - September
	To establish new planting, maintain a 1m diameter weed free area around all trees within grass. Trees within self bound gravel should be maintained totally free of weeds.	1 – 5	Spring - Autumn	1
	UNDERGROUND TREE GUY WIRES			
	Inspection / maintenance times: Quarterly and after strong winds Operations: Replace or re-secure loose or missing guy wires Adjust to suit stem growth and to provide correct and uniform tension	1 – 5	Throughout year	2
	Apply granular fertiliser according to manufacturer's recommendations	1 – 5	Spring - Autumn	Bi-annual
	Ensure trees remain firmly bedded after disturbance and re-firm as necessary	1 – 5	As required	1
	Control all pests and diseases as necessary	1 – 5	As required	To be determined
	Prune in accordance with good horticultural practice, thin, trim and shape as appropriate. Eg. Removing branches: Do not damage or tear the stem. Wounds: Keep as small as possible and cut cleanly back to sound wood. Cutting: Make cuts above and sloping away from an outward facing healthy, angled so that water will not collect on cut area. Larger branches: Prune neither flush nor leaving a stub, but using the branch bark ridge or branch collar as a pruning guide. Tools: Use clean sharp secateurs, handsaws or other approved tools. Disease of infection: Give notice if detected. Growth retardants, fungicide or pruning sealant: Do not use unless instructed			
	Prune all trees annually as needed to maintain a minimum 2.2m clear stem and desired form.	1 – 5	Autumn - early Winter	1 As required
	Watering – Regular checks using a moisture probe testing during the first two years after planting on a monthly cycle during the summer months of May-September	1 – 2	Monthly	24
	Water as necessary to ensure healthy growth	3	As required	As required
	Replace dead or damaged trees to original specification. Remove within 1 month or as soon as possible and replace within the next available planting season	1 - 5	Autumn	1
	Top up mulching to original specification annually	1 - 5	Spring	1
	Autumn LEAF REMOVAL			
	Collect accumulations of drifted leaves from the vicinity and from paved lawn area	1 - 5	Autumn/Winter	As required
	Arisings: Remove			

1.3 SOFTWORKS | HERBACEOUS PLANTING

MAINTENANCE OPERATION

- **Duration:** Defects Liability Period or 5 years, whichever is the greater.
- **Weed control:** Keep planting beds clear of weeds by applying herbicide.
- **Watering:** As necessary to ensure establishment of planting
- **Soil condition:** Fork over beds to keep soil loose, with gentle cambers and no hollows. Do not reduce depth or effect of mulch.

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
	HERBACEOUS PLANTING			
	Maintenance during defects liability period or 5 years after planting whichever is the greater			
	• Maintain weed free area to the surface of all planting areas	1 – 5	March / October	9
	• Application of granular fertilizer (15:15:15)	1 – 5	Spring	1
	• Ensure plants remain firmly bedded after disturbance and re-firm as necessary	1 – 5	As required	Each maintenance visit
	• Re-firm plant supports and replace as needed	1 –5	As required	Each maintenance visit
	• Prune as necessary to encourage healthy growth as illustrated on the drawings: Prune herbaceous perennials as required to maintain form and supply supports as needed during the growing season.	1 –5	Spring/Summer	1
	• Prune hardy herbaceous perennials in autumn retaining feature flower heads or seed heads to provide interest through the winter months	1 –5	Autumn	1
	• Prune tender perennials and borderline hardy perennials in spring once the risk of frost has passed (April / May). This is to protect the growing crown during winter.	1 – 5	April/May	1
	• Cut back early flowering perennials near to ground level after flowering to encourage fresh foliage and later summer flowering. Cut back again in spring.	1 – 5	Summer & spring	2
	• Control all pests and diseases as necessary	1 – 5	As required	As required
	• Replace any dead/ under performing plants. Where planting continually fails to establish, undertake investigations to ascertain any underlying cause.	1 - 5	March/October	As required
	• Watering – Regular checks using a moisture probe testing during the first year after planting on a monthly cycle during the summer months of May-September.	1	May/September	5
	• Water as necessary to ensure healthy growth. Water as necessary to ensure healthy growth. If water supply is, or is likely to be, restricted by emergency legislation, submit proposals for an alternative suitable source of water. Obtain instructions before proceeding.	1 – 5	As required	As required
	• Top up mulch planting to original specification at the start of each year after the cutting back of tender perennials.	1 – 5	Spring	1
	• Divide large groups of perennials every 3 years:	3	Spring/Autumn	1
	• Divide summer flowering plants in spring or autumn providing that the ground is dry enough to work.	3	Summer	1
	• Divide spring flowering plants in summer after flowering.			

1.4 SOFTWORKS | WILDFLOWERS

MAINTENANCE OPERATION

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
	WILDFLOWERS A) Maintenance during defects liability period or 5 years after planting whichever is the greater • YEAR 1-5: Autumn cut: For the annual maintenance cut in the Autumn, it is important to cut the meadow down to 1 to 2 inches (25mm to 50mm) off the ground and remove all cutting. This can be done by strimming and raking, or using a mower and collecting the cuttings. Make sure these tools are sharp. The cut is an important part of the meadows life cycle and ensures that re-growth and species diversity year on year. Cuttings should not be left on the meadow, as they add undesirable fertility to the ground. It is also important to remove all leaf litter that falls onto the area. The annual maintenance cut should be done in late September, early October. There is no need for a set date, but this timing will allow the plants in the meadow to regenerate before the first frost typically in November. You can choose to cut only half of the meadow area at one time to allow time for fauna to migrate to the uncut meadow. Allow some regrowth of the cut area before cutting the second half, but aim to have finished all cutting by the end of the first week of October. Over time alternate the areas that are cut early and the areas that are left as this will benefit species diversity. Optional early Summer cut: On fertile sites or where you might have species dominance or too vigorous early growth, a second cut at the end of May, beginning of June can be introduced. This high cut, approximately 8 to 10 inches off the ground (200mm to 250mm) to remove the flower heads but leaving enough plant stems and leaf area to regenerate, and removal of all cuttings, will help to knock back some species dominance, reduce soil fertility and open up the sward to more light and air circulation to promote diversity of lower growing species. Once the cutting has been completed and all cuttings removed, give the area a good soaking with water to encourage the next flush of growth. Introducing this early summer cut and removal will mean your second Autumn cut and removal will be later that year, up to the end of October. Control undesirable herbaceous and woody material via hand weeding. Herbicides must not be used unless with prior approval	1-5 1- 5	Sept/Oct May	1 1

1.5 SOFTWORKS | AMENITY GRASS

MAINTENANCE OPERATION

GRASSED AREAS - GENERALLY

- **General:** Maintain turf in a manner appropriate to the intended use
- **Grass height:** Maintain within range specified in clauses 25-30mm
- **Soil and grass condition:**
  - **Condition:** Maintain a healthy vigorous sward, free from disease, fungal growth, discolouration, scorch or wilt
  - **Waterlogging and compaction:** Prevent.
  - **Damage:** Repair trampling, abrasion or scalping caused by mowing
- **Ornamental turf and lawns:** Maintain reasonably free from moss, excessive thatch, weeds, frost heave, worm casts and mole hills
- **Edges:** Neat and well defined, in clean straight lines
- **Litter and fallen leaves:** Remove regularly to maintain a neat appearance
- **Before mowing:** Remove litter, rubbish and debris
- **Finish:** Neat and even, without surface rutting, compaction or damage to grass
- **Adjoining hard areas:** Sweep clear and remove arisings

Maintenance Operation Number	Prescription	Year (s)	Season	Frequency (per year)
3.2.5	**AMENITY GRASS MAINTENANCE**			
	Maintenance during defects liability period or 5 yeas after sowing / laying whichever is the greater			
	Water as necessary during establishment period to ensure healthy growth. (Weekly if required)	1	May – September	As required-(weekly)
	Cutting - maintain grass between 25-30mm using suitable machinery and remove arisings	1 – 5	May – October	As required
	Maintain sharp and even	1 – 5	May – October	As required
	Edge all lawned areas	1 – 5	May – October	2
	Spring fertilizer application – slow release 60g/m2	1 – 5	Spring	1
	Autumn fertilizer application - slow release 60g/m2	1 - 5	Autumn	1
	Apply herbicide as necessary to keep sward substantially (95%) free of broad leaved weeds	1 - 5	May - October	As required
	REINSTATEMENT OF DAMAGED LAWNS	1 - 5	May - October	As required
	Damaged turf: Remove to a depth of 40mm. Preparation: Cultivate substrate to a fine tilth. Reinstatement: Re-turfing: Quality and appearance to match existing. Protection and watering: Provide as necessary to promote successful germination and/ or establishment.			

MAINTENANCE OPERATIONS – HARDWORKS

Surfaces need to be maintained such that they provide a safe passage for all pedestrians and highway users. It is also essential that areas, which have been subject to major investment, are protected and sustained through an effective maintenance regime. The success of any streetscape project will greatly depend on the attention given to maintenance.

It is important that paved surfaces are regularly inspected so that defects can be identified and rectified. Typically, early life maintenance or aftercare of new works will be the responsibility of the Main Contractor that delivered the works. The maintenance and defects liability period will generally be 12 months. The Main Contractor should visit the site at regular intervals during the maintenance period, to inspect all paved areas, and to undertake any remedial works. At the end of the maintenance period the contractor will be required to undertake remedial works to the satisfaction of the Client.

PAVING DEFECTS - RIGID

Common defects - Paved roads deteriorate in a variety of ways, depending upon the type of construction and cause of distress. When deterioration presents a safety hazard then maintenance becomes essential. Timely maintenance, in some instances can prevent deterioration progressing to a state where reconstruction is required. The majority of failures tend to be confined to the surface layers of paved roads, i.e. they concern the bedding and jointing that surrounds stone elements.

Descriptions and illustrations of common defects are given below:

Punching - Vertical downward movement occurs in and around wheelpaths. Punching shear is resisted by both the joints and bedding. The lower of the two capacities, joint shear or bed bearing will control the elements resistance to punching. The defect occurs in flexible and rigid surfacing. Localised or isolated areas of punching are likely to be due to poor workmanship. More widespread punching is more likely to be due to under design.

Progressive cracking - Debonding of the jointing material from stone elements commonly leads to progressive cracking. The continuous action of heavy vehicle tyres on the elements dislodges and pulverises sufficient quantities of the jointing material to cause a breakdown of the joint matrix. Inappropriate design and poor workmanship are likely causes. Factors likely to have contributed to this type of failure are:

- poor compaction of the bedding
- inadequate moisture content in stabilized bedding
- depth of elements
- low jointing strength
- early pavement trafficking
- inappropriate laying pattern

Movement - If the homogeneity of the upper layer is broken, it is impossible to control lateral movement with joint widths ≥10mm. Once the surface matrix is broken, it allows the tyre interaction of the traffic to move the setts in angular directions, thus perpetuating the breakdown of the rigid surface. Ingress of water then adds to the problems. Rutting is common and depending on the construction of the pavement the underlying layers of the structure will gradually deteriorate.

Broken or damaged elements - Apart from being unsightly, cracking and spalling can become a hazard if it creates a trip. Spalling occurs during transport and laying, but can less commonly be a fault in the material. It can result during manufacture, impact loading, abrasion and weathering. Inappropriate size or depth of element results in fracture under loading.

TREATMENT OPTIONS

Maintenance treatment will depend on the type of defect and what has caused the deterioration. For some surfacings, topping up of jointing may be all that is required, but poor surface profile may require a site investigation to provide information on the condition of the pavement at depth. Suitable strategies can then be formulated based upon informed engineering judgment.

The table on the next page summarises some common defects, resulting problems and treatments.

2.1 HARDWORKS | TREATMENTS

Defect	Problem	Treatments	
Rigid		**Temporary**	**Long-term**
Expansion and contraction joint cracks	Cracking	Monitor/method statements from bedding and jointing material supplier required	Deep water ingress can lead to structural faults.
Debonding of jointing material	Initiation of failure mechanism	Monitor / investigate	Replace jointing or reconstruct if poor design
Broken or damaged elements	-	-	Replace or reconstruct
Missing elements	Trip, water ingress	Fill holes	Replace element
Rocking elements	Hazard to users	Relay	-
Spalling of arises or surfaces	Unsightly trips	-	Replace
-	Loss of stability, water ingress	Fill wide gaps if hazard	Relay elements and strengthen edge restraint if necessary
Depressions and bumps (macadam)	Hazard for users	Fill or ramp. Contact undertaker if cause is failed reinstatement	Relay
Rutting (meacadam)	Hazard for users	Monitor, warn users	Relay
Slippery surface	Hazard for users	Warn users or restore texture	Clean, restore texture or renew surfacing
Surface contamination	Hazard for users and unsightly	Clean or neutralize	Replace surfacing if necessary
Vegetation	Surface slippery	Warn users, clean	Consider increasing frequency of maintenance
Water	Surface water	Salt if freezing	Relay surfacing to correct gradients and crossfall
-	Blocked drain	Clear blockage	-

Guidance: To ensure the chosen treatment is cost effective, consideration should be given to the maintenance history of the paved surfacing, its future use and the likely failure mechanism.

2.2 HARDWORKS | MAINTENANCE

LIFTING, REPAIR AND RELAYING

Relaying elements of flexible construction should be carried out in the same way as new construction (Refer to NBS specification). Additional guidance for flags is given in BS 7533-7:2010. Removing a damaged single element prior to relaying can be difficult, particularly if it is small element, as breaking it out may disturb adjacent modules. It may be necessary to consider relaying all elements, which abut the damaged area, or to relay a full line of elements back to an edge restraint. If the surface has poor profile, elements will need to be lifted over the whole of the affected area. In all cases a complete renewal of the bedding material should always take place. An experienced paver is required to execute a good reinstatement.

Joint repairs
Where elements are part of a rigid construction and degradation of the cement mortar joint has occurred, it will be necessary to refill the joint. If necessary the joint should be raked out, which is time-consuming and costly. It may be more appropriate to use a small hand-held grinder with an attachment to remove the dust and debris, in a controlled manner, into some form of hopper. Once the joints have been cleaned out they can be refilled with a mortar appropriate to the trafficking category. Care is required to confine the mixture to the joint and prevent staining of the surface. Trafficking should only be allowed once the mortar has gained the appropriate strength.

Sealing
Proprietary sealing agents are commonly used on paved surfaces, to reduce moisture penetration of the laying course material, and minimise staining from spillages. The paving surface must be completely dry and clean before any sealer is applied with the manufacturer instructions adhered to at all times. Whilst such products may offer certain advantages, careful consideration must be given to the suitability of the sealant and any subsequent effect on the colour appearance and slip/skid resistance of the paving.

CLEANING

Generally
The following recommendations deal with vehicles and associated equipment for use on paved footways/footpaths/pedestrian areas and roads:

- The equipment should be purpose designed to sweep the particular area and surfacing product. If there is any doubt, the vehicle manufacturer should be consulted.
- Where possible, low ground pressure tyres should be fitted to reduce the risk of breaking or cracking of flags.
- Tyres should be inflated according to the manufacturer's recommendations, again to ensure minimum weight distribution per square mm.
- Polypropylene, not wire, brushes should be used.
- Sweeping brush pressures should be set to the minimum required to suit the particular task, i.e. surfaces swept regularly will require a lower setting than those swept infrequently or those covered with heavy deposits.
- When sweeping, engine revolutions should be set at the minimum required to maintain vacuum (suction) pressure.
- Operators, including reliefs, should be trained to manufacturers' recommendations and tyre and brush pressures should be regularly checked.
- Advice should be given to operators that, when equipment is stationary or left unattended, suction, brush rotation and water jetting equipment should be switched off to avoid the risk of damage to the area below the stationary equipment.
- In new or re-laid areas, agreement should be reached on a period of manual cleaning (at least four weeks) to allow the paving to settle and the joints to seal. This period may be reduced by using either a water-based bonding agent or elastomeric prepolymer sealant and by agreement with the cleansing authority on an appropriate sweeping regime.
- Following the use of mechanical cleaning operations, re-sanding of the joints in flexibly laid areas may be necessary.

The Use of Power Washing Equipment on Paved Areas
To aid in the removal of surface staining power washing equipment is often considered. Whilst such techniques offer certain benefits, particularly for larger areas, it is important that care is taken in their use to avoid damage to the structural integrity of the paving.

When using any form of Power Washer the following guidelines should be strictly adhered to:

- The power washer should be used on a setting, which is sufficient to remove the dirt without causing any further distress. A low-pressure setting is recommended.
- Do not direct the power lance directly down on to the paving, as this can result in loss of jointing material.
- Ideally a spraying movement should be adopted holding the power lance at a shallow angle, not greater than 300 across the diagonal (i.e. not parallel to joints).
- Certain high-pressure jetting machines have been known to mark / damage the surface of certain types of paving material. It is therefore prudent to carry out a small test area before commencing on a larger area.
- The area should be inspected after cleaning to ensure that joints are full.

General Dirt and Detritus
To remove general dirt and detritus, regular brushing is recommended. If detritus reduces the intensity of the colour of the material then this can be reestablished by scrubbing with a mild detergent e.g. washing up liquid, and hot water.

Ensure all the detergent has been thoroughly washed from the surface on completion of the cleaning and the resulting run-off is carefully channeled to either drainage points or containers where it can be safely disposed of.

Moss, lichens and algae
Moss, lichen and algae can be prevalent on hard surfacing where the area is heavily shaded, is under trees or is not laid to an adequate fall. If such growths do occur and are considered undesirable then the area should be treated with a proprietary weed or moss killer used in accordance with the manufacturers' instructions. Such products take some days to be effective and are most effective when applied during a spell of dry weather. The washes work best if any thick growths are scraped off first and the wash is well brushed in. Some treatments leave a residue to discourage the re-growth of the moss and algae but this will only be of limited value if the surrounding conditions leave the paving damp and in shade.

Rust Stains
Initially action must be taken to eliminate the sources of staining. To remove the rust stain, the surface should first be wetted with clean water and then the affected area treated with a 7 to 10% dilution of Hydrochloric acid solution.

Guidance on the safe use of chemical treatments (Acid Washing) is given later in this document.

2.2 HARDWORKS | MAINTENANCE

Oil Stains
Oil can penetrate readily into hard surfacing materials, but it should not stain if any spillages are removed promptly with an absorbent material e.g. paper towels, cloth or absorbing granules. Do not attempt to wipe the stain as this will drive the oil into the surface of the units and spread it over a wider area.

If the stain persists then an emulsifying degreaser should be employed. Brush the cleaner onto the affected area, leave for a period of time according to the manufacturers instructions and then wash the emulsified oil away with plenty of clean water.

Alternatively the surface can be scrubbed with a detergent and hot water taking care to ensure that the strength of the detergent is not detrimental to the appearance of the paving. However, for persistent oil staining, steam cleaning may have to be considered.

Bitumen Stains
Fresh bitumen should be allowed to cool down before removing it with a paint scraper or similar. If it is particularly resistant, the use of ice to make the bitumen brittle may be required prior to scraping it from the paving. Any residue should be removed with an abrasive powder and finally the whole area rinsed with clean water. Certain proprietary cleaning agents are available to remove bitumen but these should be tested on an inconspicuous area of paving first.

Graffiti and Paint Stains
Both paint and graffiti are difficult to remove from most hard surfacing materials. Fresh wet paint should be soaked up with an absorbent material without wiping the paint, as this will spread the stain. It should then be treated with a suitable solvent such as white spirit and then the area washed with a de-greasing agent taking care in the disposal of the run-off material.

Dried paint should be scraped off as far as possible and then an appropriate paint remover applied.

Paint manufacturers may often be able to give more detailed advice on the removal of paint and graffiti. Therefore they should be consulted directly for specific recommendations.

Epoxy and Polyester Stains
Areas of solidified epoxy or polyester resin can be removed by carefully burning off the area with a blowtorch. Care must be taken not to inhale any fumes given off.

If, after burning, a black stain remains, this can be removed by scrubbing with detergent and hot water. For larger areas grit blasting may have to be considered, however the effect of such treatment on the micro texture of the surface should be carefully considered. Again it is advised that a small area be tested before any large-scale operations are undertaken.

Smoke, Fire and Tobacco Stains
Normally such stains can be removed by scrubbing with detergent and hot water. Where the stains persist, a mixture of scouring powder and household bleach can be used. It is important the bleach is washed from the area with clean water once cleaning is completed and the run-off carefully disposed of.

Beverage Stains
These can normally be removed by scrubbing the stain with detergent and hot water. If the stain is persistent, apply a household bleach solution and then rinse the area with clean water taking care to dispose of the run-off safely.

Chewing Gum
Chewing gum is a particularly difficult substance to remove from hard surfaces.

Newly discarded gum can be scraped off by using a mechanical scraper but hardened gum can only be removed by both freezing the gum and chiseling it from the surface of the paving or utilising a hot water/steam cleaner.

For specific advice on chewing gum removal it is recommended that specialist contract cleaning companies be contacted directly for further details.

Scuff Marks from Vehicle Tyres
These can normally be removed by steam cleaning, or by scrubbing the area with detergent and hot water.

It is important that prior to any acid cleaning being undertaken, the paving is checked to ensure that any signs of vanadium staining have thoroughly weathered away before acid cleaners are applied.

If some form of chemical treatment is required to remove more stubborn vanadium staining, then this should be undertaken using an organic acid that will not have the aforementioned effect of “fixing” the stain to the paving.

Acid Washing
Stubborn and persistent stains that will not generally weather away naturally will require the application of a specific acid cleaning treatment to remove them.

Prior to any acid cleaner being applied, the surface must be thoroughly wetted with clean water to prevent the acid being absorbed directly into the paving. A dilution of 7 to 10% of hydrochloric acid should then be prepared and applied to the affected area.

As the staining begins to dissolve, some frothing may be apparent, which should be followed by agitation of the surface using a stiff bristle brush to completely remove all trace of the stain.

Once this process is complete the whole surface should be rinsed thoroughly with clean water, taking care to dispose of the run off safely. In the vast majority of cases, one treatment will be sufficient; however, in some cases re-treatment may be required.

When using any form of chemical treatment the following guidelines should be strictly adhered to:

- With deeper stains, the degree of acid treatment may result in an acid etched appearance.
- Protective clothing (gloves, boots, goggles etc.) should be worn at all times when using chemicals and the appropriate first aid measures must be available on-site.
- Take care to ensure that surrounding materials and landscaping are protected. Soft landscaping and exposed metals can be severely affected by chemical treatments.
- It is better to treat several times with the correct dilution than to use concentrated acid, which may damage the surface of the unit.
- When diluting acids, always add acid to water and not water to acid.

General Cleaning
An annual detergent wash is also recommended.

Drainage Channel
An annual detergent wash is also recommended.

3.0 STREET FURNITURE | MAINTENANCE

MAINTENANCE OPERATIONS – STREET FURNITURE

In addition to the recommendations below, also refer to the maintenance and operational instructions from the individual street furniture suppliers. Advice from the suppliers can also be sought regarding the maintenance of their products using the contact details supplied.

Timber to Benches / Seating

Timber components should be inspected every 6 months, more in exposed locations, and cleaned to prevent dirt or moss build up.

Hardwood can be cleaned with a Molecular Nano (MN) cleaning product and treated with an MN sealant (a non-film forming hardwood treatment that slows down greying, and protects against dirt and other factors that impact the quality of the wood). This is a good time to check for any damage or splintering that may require repair. Splinters, sharp edges or graffiti can be removed through light sanding.

Resin or gum exudation may occasionally occur on the finished surface of timber, especially during periods of warm weather. The condition generally will diminish with the passage of time. Should excesses of resin remain on the surface, these may be removed using a sharp blade. Care should be taken to work with the grain and to avoid marking the surface.

If left in the natural state the long life expectancy of Naturally Very Durable Hardwood is not significantly impaired. A light sanding can bring back the colour of the grain.

Steel Furniture: Bollards & Cycle Stands

The stainless steel should be washed down with soap or mild detergent and warm water followed by a clear water rinse.

For folding bollards, ensure the post is kept clean and free of debris. Clean and lubricate the lock using a lubricant similar to WD40. Always ensure the cover plate is closed when the bollard is not in use. Clear any debris around the cover plate and hinge.

MAINTENANCE OPERATIONS – DRAINAGE

In addition to the recommendations below, also refer to the maintenance and operational instructions from the individual drainage suppliers. Advice from the suppliers can also be sought regarding the maintenance of their products using the contact details supplied.

Drainage Channels

Inspections should be carried out at least once a year. Drainage channels should be inspected for damage from high stress. Broken channels / gratings should be replaced.

Particularly following storms, the efficiency of the gullies should be checked. The bucket should be removed periodically and checked for blockages. Occasionally water should be poured into the gully and checked that it disperses freely.

Levels of paved areas should be checked and compared with the installation drawings. Block paving should be regularly checked for signs of lateral movement (opening or closing of joints) possibly induced by vehicle braking or manoeuvring.

The channels should be cleaned out carefully ensuring the surface finish is not damaged. A shaped shovel (e.g. a trowel) may be used within channels with removable gratings. On longer lengths of channel, pressure water jetting is the usual method of cleaning, with a vacuum tanker collecting the water and debris at a convenient point, usually the outfall.

On completion of cleaning operations, the channel bore should be flushed through with water. Where required, joint sealant should be repaired in accordance with the relevant manufacturer's instructions.

The buckets of sumps or gullies should be removed, emptied, cleaned and their drain holes cleared. On no account should boiling water or cleaning agents be brought into contact with polyester channels.

Drainage Channel Gratings

The locking system for the channel grating should be inspected and checked for tightness.

To remove the gratings, insert the Grating Locking Tool hook under the grating bar and pull grating up sharply to snap grating free. Avoid lifting the grating from one end, which can distort the grating.

Security locks should be fitted to gratings where possible to prevent unauthorised removal.

Contact the supplier - ACO for further advice. Contact: +44 (0) 1462 816666.

Vortex Flow Control

This should be inspected at least once a year and jetted to remove any silt. Any blockages to the flow control should be removed and any damage should be repaired as required.

Catchpit

This is a catchpit chamber installed to prevent silt from entering the attenuation tank, it should be inspected at least once a year and jetted as required to remove any silt.

All other chambers should be inspected visually for blockages yearly and cleaned/ jetted as required.

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